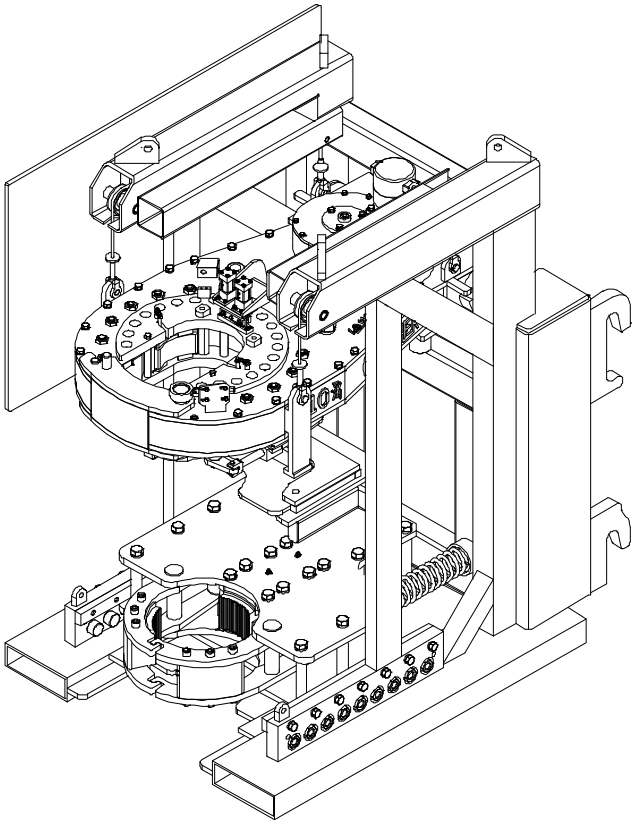
SUPERIOR
Manufacturing & Hydraulics

TECHNICAL MANUAL

10 3/4" CLINCHER® REMOTE TONG

AND

11 3/4" LOCKJAW™ BACKUP



COVERS

TONG MODEL
CLE1075-02

BACKUP MODEL
BUCS1175-01

SUSPENSION SYSTEM
CRSS10750

Published 11/2002

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The products described in this manual are covered by U.S. and foreign Patents and/or pending Patent Applications.

This manual is not a controlled document and is subject to revision without notice. To receive updates and insure you have access to the latest information concerning the 10 3/4" CLINCHER® Remote Tong and 11 3/4" LOCKJAW™ Backup, we request you complete this form and return the lower half to SUPERIOR Manufacturing and Hydraulics by mail or facsimile.

Name: _____
Company: _____
Address: _____
Address: _____
City: _____ **State:** _____
Postal Code: _____ **Country:** _____
Telephone: _____ **Fax:** _____

Tong Model No.: _____ **Serial No.:** _____
Backup Model No.: _____ **Serial No.:** _____
Assembly Date: _____

- - - -

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10 3/4" CLINCHER® REMOTE TONG and 11 3/4" LOCKJAW™ BACKUP

REVISION TABLE			
Section	***Page***	***Date***	***Description***
N/A	N/A	12/02	Table of Contents, Section 4, added Suspension System Spring Instructions.
1	2	12/02	Added Warning on Suspension System springs.
4	7	12/02	Added Suspension System Spring Instructions.
11	5-6	12/02	Revised Large & Small Spring illustrations, added Warning & Ref. Notes.
7	5-13, 23-25, 31-32	03/03	Revised Parts Lists CLE1075-02, BUCS1175-01 & CRSS10750
9	1, 3, 6A, 6B, 17-20, 27	03/03	Revised Table of Contents, added Sealed Idler Bearing PN 1905 and Installation for PN 1905. Revised Illustrations Top View, Top Cage Plate, Bottom Cage Plate, Remote Cage Plate, Remote Pivot Pin & Bottom View.
10	3	03/03	Revised Illustration 11 3/4" LJ Backup Assembly
11	3 & 6	03/03	Revised Illustrations Transport f/Susp. System & Small Spring Assy.
3	1	04/23/03	Added chart for 5/8" Width Dovetail Inserts.
7	5-13, 33	04/23/03	Revised Parts List's CLE1075-02 & CRSS10750-01
9	11	04/23/03	Revised Illustration Encoder Assemblies on Secondary Gear
9	8	08/21/03	Revised Illustration Outboard Idler Gear Assy (Idler Gear PN was incorrect).
3	1	01/22/04	Revised Dovetail Strip Die Chart.

REMOTELY CONTROLLED CLINCHER® TONG AND LOCKJAW™ BACKUP FOR USE WITH VARCO CASING ROUGHNECK

HAZARD WARNING

Nomenclature used in this manual:

WARNING	concerns an operating procedure or practice that, if not strictly observed, can result in injury to personnel or loss of life
Caution	concerns an operating procedure or practice that, if not strictly observed, can result in damage to or destruction of equipment
Note	concerns an operating procedure or practice that needs highlighting

CLINCHER® Tongs and Backups are manufactured to provide a means of making up or breaking out high torque tubular connections. They utilize high pressure hydraulic fluid power which can cause the tong to move suddenly and with great force if the tong is not properly rigged up and operated. **CLINCHER®** Tongs and Backups contain rotating and reciprocating parts which can severely or fatally injure personnel who are operating, repairing, or near this equipment during its operation. **WARNING: Tongs and Backups are not to be operated by untrained personnel or personnel with diminished physical or mental capacity. No work of any type, including changing of dies, is to be carried out while the tong and backup are connected to any hydraulic power unit.**

CLINCHER® Tongs and Backups are heavy tools. They must be handled using appropriate equipment and methods. Horizontal and vertical position control will be accomplished by means of a Varco Casing Roughneck System. **WARNING: Users must insure the entire lifting system including cables, rig mounting points, lift cylinders, tong lifting brackets/bridles, winches, pulleys, counter weights, etc., are in good condition and capable of handling the static weight of the tong, backup, and suspension system plus any loads which could be transferred to it during the makeup or breakout process PLUS any shock loads which may be seen during operation. This system must readily allow downward movement equal to a minimum of the thread makeup distance to avoid overloading the suspension system and/or damage to equipment.**

WARNING: Do not attempt to rotate tong and tubulars unless backup is closed and gripping the lower portion of the tubular. Failure to follow this procedure will cause Iron Roughneck to be forcibly rotated around tubulars causing equipment damage and injury or death of personnel who are in the area.

REMOTELY CONTROLLED CLINCHER® TONG AND LOCKJAW™ BACKUP FOR USE WITH VARCO CASING ROUGHNECK

HAZARD WARNING

WARNING: Users must provide a means of safely controlling the tong, backup, and suspension system movements in all directions when it is in use. Failure to account for the its size, weight, movement, and the amount of torque developed could result in personnel injury or death.

CLINCHER® Tongs and Backups utilize high pressure hydraulic fluids. Portions of the tong and backup, control valves, hydraulic lines and cylinders may contain high pressure fluid even when the power unit is de-energized and the fluid supply hoses are disconnected. During normal operation the temperature of the hydraulic fluids as well as hoses, piping, valves, etc., can rise to a level which can cause burns. **WARNING: Personal protective gear including safety glasses, face shields, protective gloves and protective clothing must be worn to guard against the hazards of high pressure fluids. Tight fitting clothing is required to prevent entanglement in rotating components. These tools should be serviced by thoroughly trained and qualified hydraulic technicians using procedures to safely insure hydraulic pressure is bled from these circuits.**

WARNING: Attempting to operate this unit with a power unit designed for open center valves will result in the power unit operating continuously at maximum pressure, will cause overheating, and may cause equipment failures possibly exposing personnel to high pressure, high temperature hydraulic fluid leaks.

The **CLINCHER®** Tong is equipped with a door interlock system which prevents tong rotation whenever the door is open. This system is to be tested before each mobilization and at every shift change. Should this system be determined to be inoperative, the tong is to be removed from service and tagged as ***in-operative*** until repairs are made. **CAUTION:** Operating the tong with the door in the open position could result in severe damage to the equipment and will void all manufacturer warranties. **WARNING: Operating the tong with the door open by means of a defective or bypassed door interlock system exposes the operator and nearby personnel to potentially fatal hazards.**

No attempt should be made to operate the **CLINCHER®** Tong and Backup for any purpose other than which it is intended. This system is capable of generating very large clamping forces and torsional loads which, if improperly applied or controlled, could result in damage to the tubular, to the tong and backup, or could possibly result in injury or death of personnel. Do not attempt to operate the unit without correct dies and the proper size tubular being in the tong and backup. See Section 3 for more information concerning the selection and use of dies. **CAUTION: Operating this equipment without the correct size, type, and orientation of dies can result in damage to the equipment or tubulars being handled.**

WARNING: Suspension System springs can store considerable energy which could cause injuries or fatalities if proper removal procedures are not utilized.

HYDRAULIC PRODUCT SAFETY

WARNING: Valve lever (spool) may "stick" (not center) under certain conditions allowing the hydraulic equipment to continue to operate and could cause serious injury, death or equipment failure.

VALVE SAFETY: Read and follow instructions carefully. Failure to observe instructions and guidelines may cause serious injury, death or equipment failure. A sticking valve (spool bind) may be caused by one or more of the following factors:

DIRTY OIL: Oil must be filtered to a minimum of 25 microns. Filters should be changed regularly - spin-on types after 50 hours of initial use and then after every two hundred fifty hours of use. Use of a condition indicator is recommended. Consult your tractor or implement owner's manual for filtration and changing recommendations for internal systems.

OIL REQUIREMENTS: Premium quality anti-wear type oil with a viscosity between 100 and 200 SSU at operating temperatures. Certain synthetic oils may cause spool seals to swell and the valve to stick. If in doubt, call CROSS Engineering.

IMPROPER HOOK UP OR MOUNTING: Always use the proper size fittings. Hook up "in" & "out" as noted on the valve body. Do not overtorque pipe fittings. Mounting surfaces should be flat and care should be used when tightening mounting bolts. Over-tightened bolts can cause spool bind and casting breakage. When hooking a valve in series, always use a power beyond sleeve. Consult your tractor or implement manual to make sure you have the proper quick disconnect line connected to the inlet of the remote valve.

MISAPPLICATION: Always use the proper valve for the job. CONVERTA, CD, CS or CA valves should never be used for metered heavy load lifting - loaders or similar applications. Use an open center valve for open center applications and a closed center valve for closed applications. If in doubt, check with your tractor dealer. Contact CROSS if the valve allows the hydraulic equipment to creep excessively.

MAINTENANCE: Make sure all bolts are tightened and torqued to the recommended specification. Bent or broken parts should not be used. Replace immediately. Always use exact replacements. Always protect valve spool from paint overspray.

Faulty quick disconnects can cause high back pressures and sticking spools. Check quick disconnects periodically to make sure they are functioning properly. If valve spool does not center or appears to stick, do not use!

PUMPS & MOTORS SAFETY:

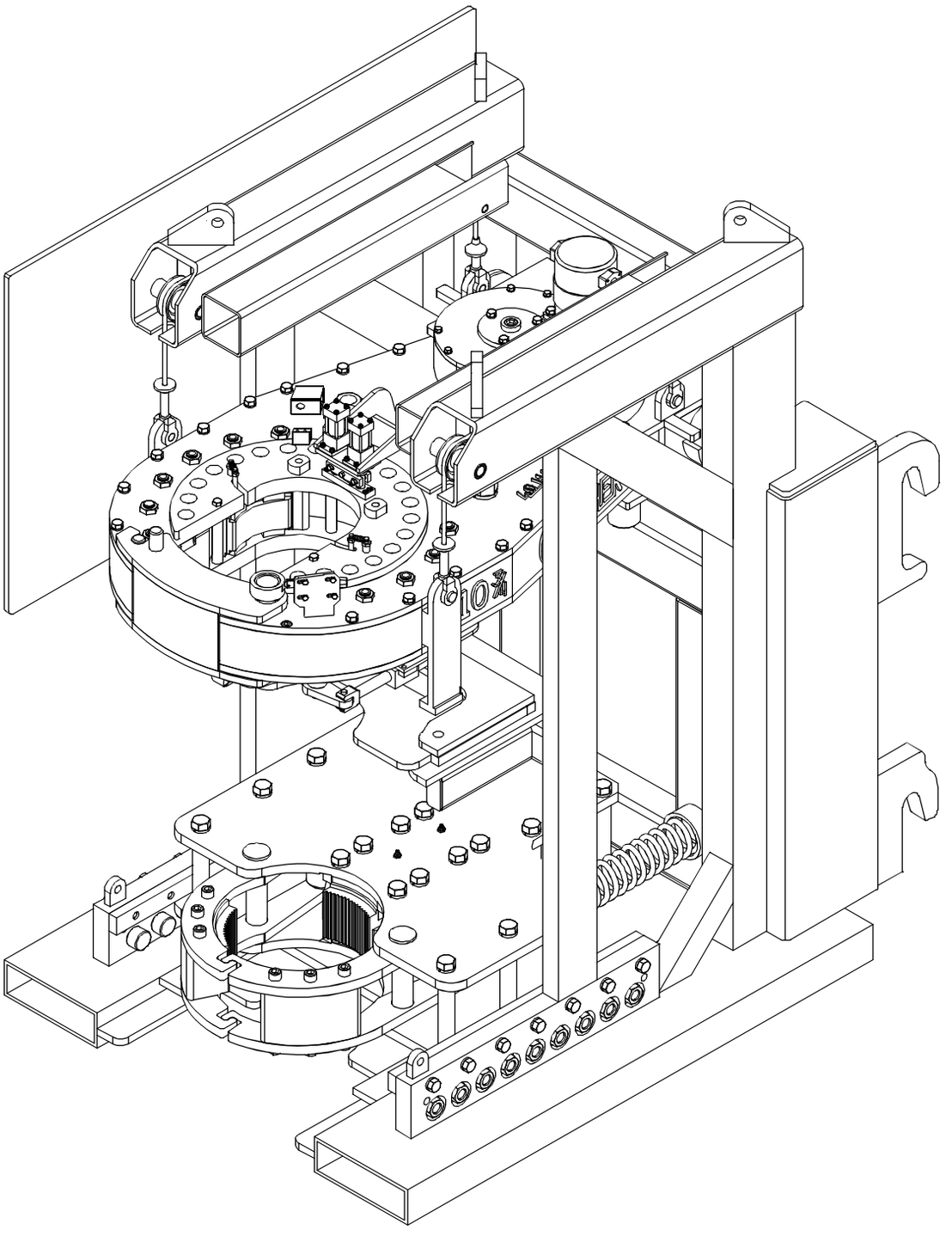
A relief or bypass in your hydraulic system is necessary to prevent pump from breakage due to overpressurization. Use correct fittings and proper oil as noted in the technical service manual packed with each unit. Change oil as recommended by your implement or tractor manufacturer.

CYLINDER SAFETY:

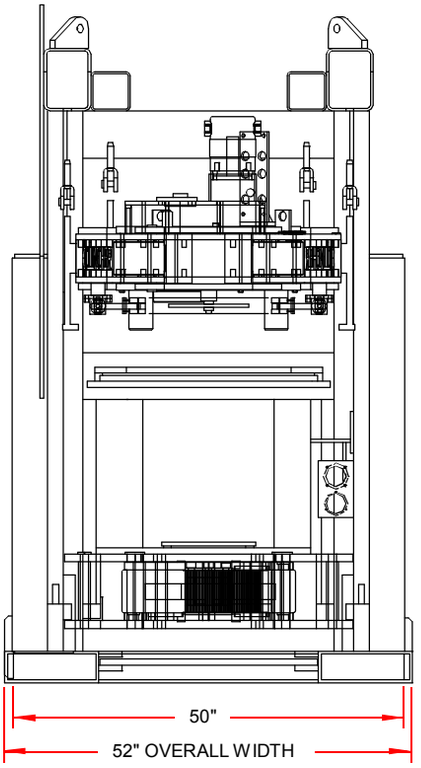
Check clevis clearances before, during and after extending the cylinder and before using the cylinder under pressure to avoid possible injury, or bent or broken rods caused by binding. Never operatea cylinder above recommended pressures. Never use a cylinder as a safety device when trans-porting equipment.

PINHOLE LEAKS:

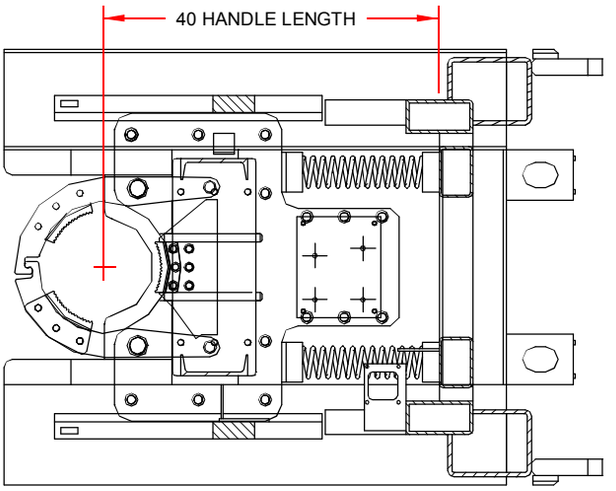
If you observe a pinhole leak, discontinue use of the component. If oil has penetrated your skin or contacted your eye, seek medical attention immediately!



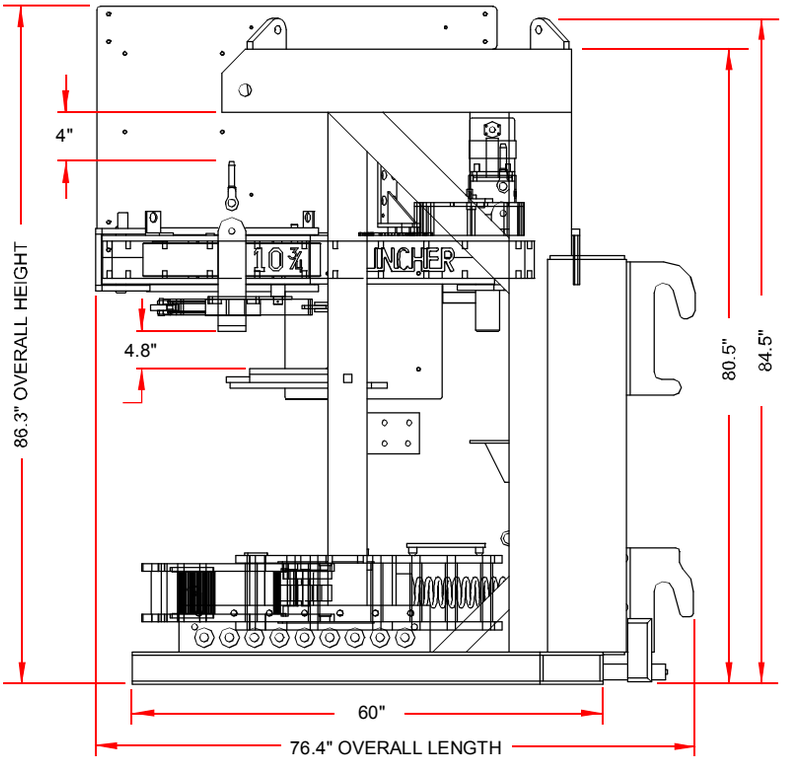
ELECTRONIC REMOTE
10 3/4” CLINCHER® TONG,
11 3/4” LOCKJAW™ BACKUP
& SUSPENSION FRAME



FRONT VIEW



TOP VIEW



SIDE VIEW

DIMENSIONAL VIEWS

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GENERAL DESCRIPTION and APPLICATION

The **CLINCHER®** products described in this manual and used in connection with Varco Casing Roughneck System (VCRS) to allow "Hands Off" stabbing, make-up or break-out of casing, tubing, or drill pipe. Products covered in this manual include:

1. CLE1075-02 **CLINCHER®** 10 3/4" Remotely Operated Casing Tong

2. BUCS1175-01 **CLINCHER®** 11 3/4" Remotely Operated **LOCKJAW™** Backup

3. CRSS10750 **CLINCHER®** Tong and Backup Suspension System for Varco Casing Roughneck

The CLE1075-02 Tong is a remotely operated high torque hydraulic tong capable of handling tubulars ranging from 2 3/8" to 10 3/4" in diameter. It is provided with Hydraulically Operated Tong Door Actuator, Hi/Lo Gear Shifter, Motor Speed and Make/Break Backing Pin Controls. Additionally, a Cage Plate Position Sensor and Control System simplify remote operation by automatically stopping reverse rotation of the Cage Plate in the open throat position.

The BUCS1175-01 **LOCKJAW™** Backup is a remotely operated high torque hydraulic backup which fully encircles the tubulars to compliment the tong during make-up and break-out operations. Its patented **LOCKJAW™** geometry provides maximum structural strength in the smallest possible package with minimal moving parts. It features a door position sensor to limit the amount of clamping force developed if inadvertently used on oversized tubulars which prevent full door closing/locking.

The CRSS10750 Suspension System is designed for use in a Varco Casing Roughneck System. The CRSS10750 provides a means of positioning the Tong, Backup, and Instrumentation/ Control System framework which can be quickly installed or removed from the VCRS. Removal is as quick and easy as installation. Additionally, the Suspension System can be configured to function as a shipping and storage container.

DESCRIPTION and APPLICATION

The **CLINCHER®** Tong and Backup system is an "open-throat" design which can handle tubulars as small as 2 3/8 inches to as large as 10 3/4 inches in diameter. The Backup can accommodate tubulars as large as 11 3/4 inches. This system features two (2) jaws in the tong and three (3) jaws in the backup which encircle the pipe. Wrap Around jaws and dies, combined with our low friction jaw technology, constant radial load cam system and compensating jaw design provide exceptional gripping capabilities with reduced pipe deformation, stress and marking. Using our non-marking aluminum die system or **GRIT FACE™** dies in the Tong and Backup will now allow stainless steel corrosion resistant alloys (CRA) to be run as quickly and easily as a traditional tong runs conventional steel tubulars.

Notable Features and Benefits

Low Friction Jaws	increases cam angle efficiency to allow use of aluminum dies
Splined Die System	aligns the die with the tubular and more evenly distributes radial load, essentially wrapping the die around the tube reduces pipe stress, deformation and minimizes marking
Constant Cam Angle	insures an adequate radial load is available regardless of relative rotation to enhance performance on undersized pipe
Die Retention Method	provides an enhanced method of preventing equipment damage and die loss if the pipe is inadvertently moved while the tong or backup are still gripping the pipe
Self Adjusting Brake	eliminates need to manually adjust brake bands to compensate for normal wear

In addition to these unique features listed above, the **CLINCHER®** Tong and Backup System is also equipped with numerous standard features including:

Door Interlock	prevents tong ring gear rotation whenever the tong door is open but allows control and operation of backup and lift cylinder at all times
Encoder Adapter	accepts customer's turns encoder to signal to a torque/turn computer
Pressure Control Valve	adjustable pressure control valves allow the customer to limit the amount of pressure applied and torque developed

The features described above are covered by US and foreign patents or pending US and foreign patents.

DESCRIPTION and APPLICATION

TONG APPLICATION

After completing the make-up or break-out cycle, the jaws are opened by reversing the tong motor to drive the ring gear and cam surfaces in the opposite direction until the reversing pin contacts the ring gear shoulder. Springs are used to return the jaws to their fully open position.

The Tong's cage plate braking system is self adjusting to compensate for brake band wear. Field adjustments are not required under normal conditions.

BACKUP APPLICATION

The **CLINCHER® LOCKJAW™** Backup has an "open throat" design with three jaws that encircle the pipe. The front jaws are operated by cam surfaces on the rear jaw cylinder. During a jaw closing cycle, the front jaws swing in and interlock as the rear die approaches the pipe. Once locked on the pipe, pressure is locked in the backup cylinder by a load holding valve. When opening the backup jaws, the cylinder operation is reversed to retract the rear die and unlock the jaws. Springs move the front jaws to their fully open position.

DESCRIPTION and APPLICATION

Maximum Torque	35,000 ft.lbs. / 47,454 Nm
Maximum Operation Pressure	3,000 psi / 207 Bar
RPM @ 47 GPM/178 LPM: Manual Gearbox **High** **Low**	 42 7
Handle Length Tong	40" / 101.6 cm
Overall Length Tong	59.5" / 151.1 cm
Overall Length Backup	55.5" / 141.0 cm
Overall Length Tong, Backup & Suspension System	76.4" / 194.1 cm
Overall Width Tong, Backup & Suspension System	52.0" / 132.1 cm
Overall Height Tong, Backup & Suspension System	86.3" / 219.2 cm
Weight Tong (approximate) **Weight Backup (approximate)** **Weight Suspension System (approximate)** **Combined Weight Tong, Backup & Suspension System Including Varco supplied Control System**	2,000 lbs. / 907.0 kg 1,400 lbs. / 636.7 kg 4,645 lbs. / 2,111.4 kg 8,045 lbs. / 3,656.8 kg
Jaw Capacity / Tong	2 3/8" thru 10 3/4" LF 2 3/8" thru 10 3/4"
1 Backup Jaw Size	2 3/8" thru 11 3/4"
Gripping Range for Dovetail Tong Jaws (under nominal jaw or adapter sizes)	3/8" / 1.5 cm undersize
Gripping Range for LOCKJAW™ Backup dressed with Dovetail Adapters	3/8" / 1.5 cm undersize

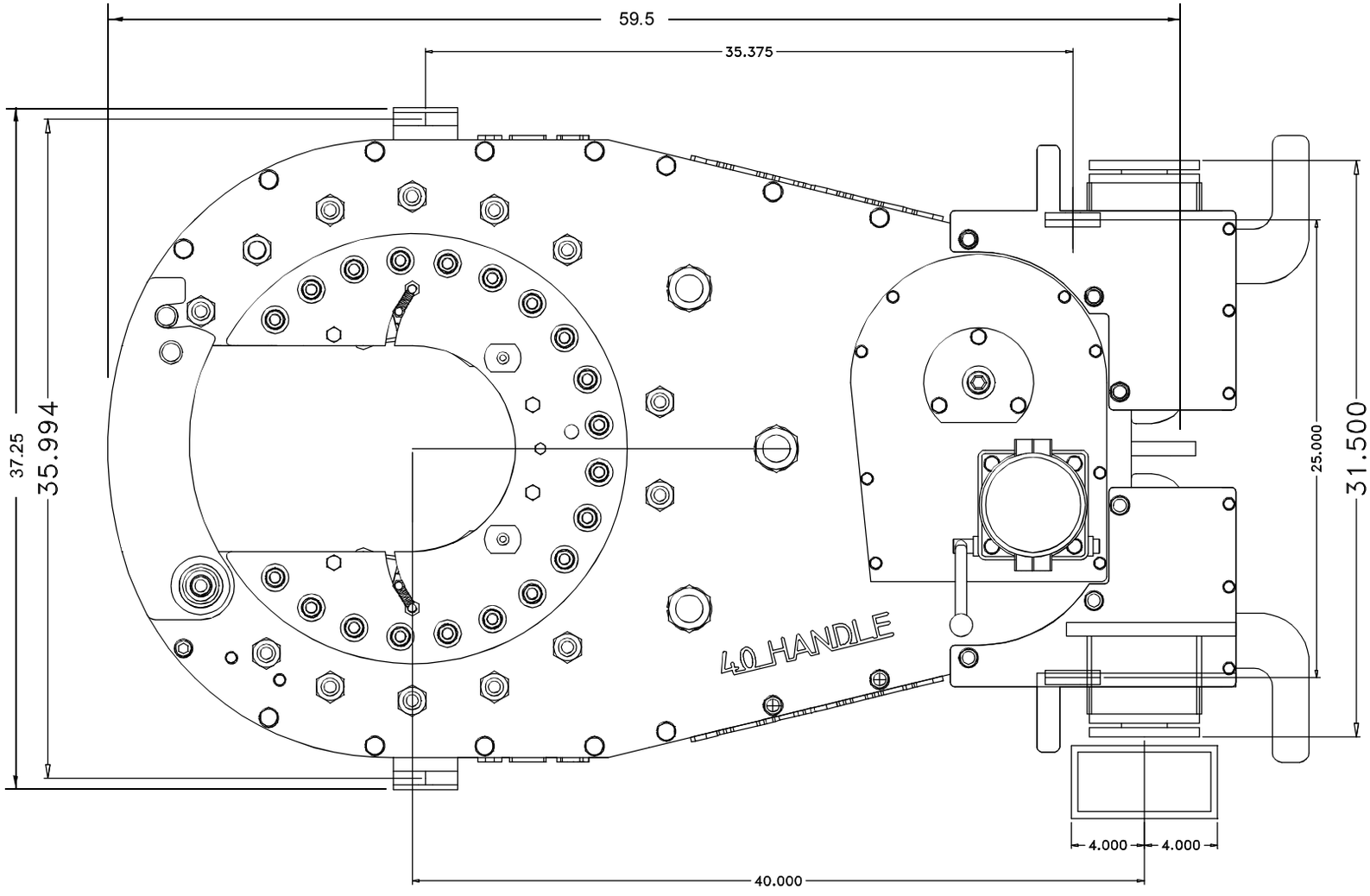
Operates using Dovetail Strip Dies, Steel Tooth Wrap Around Dies, **GRIT FACE™** Wrap Around Dies and Aluminum Wrap Around Dies

Standard Equipment:

- Remote Control
- Door Interlock
- Self Adjusting Brake
- Automatic Cage Plate Control

Optional Equipment:

- Two Speed Hydraulic Motor
- Electronic Solenoid Dump Valve
- Hydraulic Intensifier for Backup
- Shipping Stand, or Skid
- Varying Outlets for Torque Turns Computer Sending Units



10 3/4" TONG DIMENSIONS

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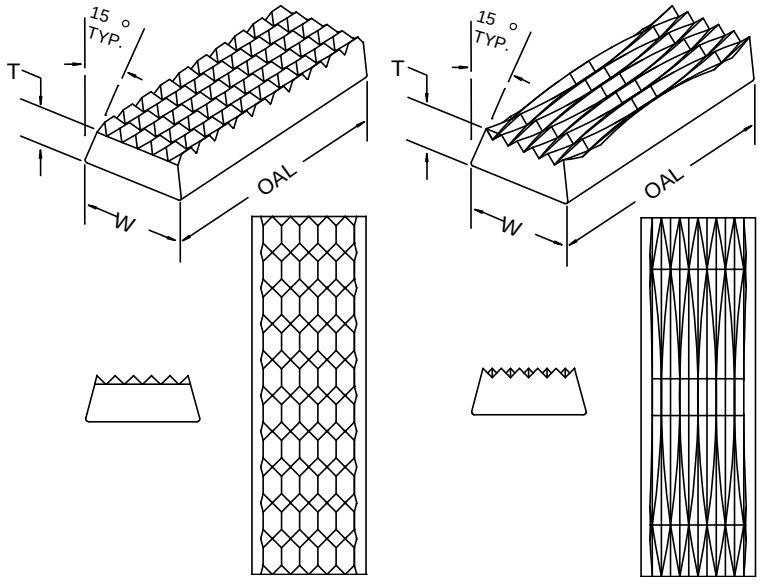
REFER TO VARCO HYDRAULIC SCHEMATIC

CLINCHER® DIES

Many **CLINCHER®** Tongs and Backups utilize jaws and/or adapters which accept Dovetail Inserts (AKA Pencil Dies or Strip Dies) to effectively grip tubulars. Jaw systems and jaw adapters are also available which accommodate Wrap-Around Fine Tooth Steel Dies, **GRIT FACE™** Dies and Aluminum Dies. The drawings in this section describe the jaw and adapter systems.

In addition to the appropriate jaws, die adapters and dies required for a specific tubular OD, a set of upper and lower guide plates will be needed to fully utilize the hands off stabbing capabilities of the VARCO Casing Roughneck System. These plates and their part numbers are also described in this section of the manual.



STRAIGHT TOOTH **DIAMOND TOOTH**

> ***Note:*** Diamond Tooth Dies are used when a more aggressive bite is required.

Thickness	Width	OAL	P/N Straight Tooth	P/N Diamond Tooth
5/16	5/8	3 1/2	★	★
5/16	5/8	3 7/8	DTI4052	★
5/16	5/8	4 1/2	DTI4002	★
3/8	5/8	3 1/2	DTI4030	★
3/8	5/8	3 7/8	DTI4051	★
3/8	5/8	4 1/2	DTI4001	★

Thickness	Width	OAL	P/N Straight Tooth	P/N Diamond Tooth
17/32	5/8	3 1/2	DTI4031	★
17/32	5/8	3 7/8	DTI4053	★
17/32	5/8	4 1/2	DTI4003	★
5/8	5/8	3 1/2	DTI4032	★
5/8	5/8	3 7/8	DTI4054	★
5/8	5/8	4 1/2	DTI4004	★
11/16	5/8	3 7/8	DTI4055	★
11/16	5/8	4 1/2	DTI4005	★
3/8	1	3 7/8	DTI1505	★
3/8	1 1/4	3 7/8	DTI1614	★
3/8	1 1/4	5	DTI1610	★
7/16	1 1/4	3 7/8	DTI1612	DTI1612D
7/16	1 1/4	5	DTI1617	DTI1617D
1/2	1 1/4	3 7/8	DTI1601	DTI1601D
1/2	1 1/4	5	DTI1602	DTI1602D
9/16	1 1/4	3 7/8	DTI1622	DTI1622D
9/16	1 1/4	5	DTI1623	DTI1623D
5/8	1 1/4	3 7/8	DTI1632	DTI1632D
5/8	1 1/4	5	DTI1633	★
11/16	1 1/4	3 7/8	DTI1642	★
11/16	1 1/4	5	DTI1646	★
3/4	1 1/4	3 7/8	DTI1651	★
3/4	1 1/4	5	DTI1693	★
3/4	1 1/4	5 7/8	DTI1662	DTI1662D
13/16	1 1/4	3 7/8	DTI1661	★
13/16	1 1/4	5	DTI1664	★
7/8	1 1/4	3 7/8	DTI1671	★
7/8	1 1/4	5	DTI1673	★
1	1 1/4	3 7/8	DTI1691	★
1	1 1/4	5	DTI1697	★

★ Available upon request.

CLINCHER® DIES

CLINCHER® Wrap Around Dies are available in three types:

Fine Toothed Steel Dies:	for low to ultra high torque applications on carbon steel tubulars including tubing, casing, and drill pipe
Smooth Faced Aluminum Dies:	for low to moderate torque applications on fiberglass and corrosion resistant alloy (stainless steel) tubulars
GRIT FACE™ Dies:	for low to high torque applications on fiberglass and corrosion resistant alloy (stainless steel) tubulars where the use of steel dies is prohibited as well as on carbon steel tubulars where reduced marking is desired

CLINCHER® Dies are designed to match the OD of the tubing, casing, coupling, or accessory being made up or broken out. Each die is stamped on the top or side to identify its size. Using Fine Toothed Steel Dies which are slightly larger than the tubular is acceptable provided the difference in diameters is less than 3/32" (0.093"). Aluminum and **GRIT FACE™** Dies should be matched with the specific tubular diameters required. **Note:** The use of improperly sized dies can result in reduced torque capacity, increased pipe marking, and reduced die life.

CAUTION: Do not attempt to grip tubular diameters which are larger than the dies being used. Failure to observe this precaution can result in damage to the tubular or tong jaws.

In emergencies where correct die sizes are unavailable, some operators have successfully used two different sizes of dies to accommodate unusual, nonstandard diameters.

CLINCHER® Wrap Around Dies are manufactured in specific diameters to match standard tubing and casing diameters, API coupling diameters, selected work string connection diameters and certain commonly used premium connection coupling diameters. **CLINCHER®** Wrap Around Dies should not be used on tubulars which are larger than the nominal die size. Steel Toothed Dies can be used on tubulars which are no smaller than 3/32" (0.093") less than the nominal die size. Aluminum and **GRIT FACE™** Dies should be matched with the specific tubular diameters required.

Note: Fine Toothed Steel Dies are normally stocked in our Broussard, Louisiana facility. A partial listing of commonly manufactured sizes is shown below. Aluminum and **GRIT FACE™** Dies are normally made to order although a limited range of sizes and small quantities may be available from stock. Contact SUPERIOR Manufacturing & Hydraulics for information concerning availability of stock and special die sizes.

JAWS & ADAPTERS WITH DOVETAIL DIES

Ref Line No	Qty Reqd	Unit	Tubular Product &Tong or Backup Components	Description	CLINCHER® Strip Die Jaw or Adapter Part Number (Note 2)	CLINCHER® Splined Jaw or Adapter Part Number (Note 2)	CLINCHER® DOVETAIL or Wraparound Die Part Number	standard dovetail die thickness required	dovetail die overall length required	Upper Guide Plate Part No.	Lower Guide Plate Part No.	nominal jaw & adapter sizes	dovetail die part number for 3 7/8" overall length>	DTI1661	DTI1651	DTI1642	DTI1632	DTI1622	DTI1601	DTI1612
													dovetail die thickness>	13/16	3/4	11/16	5/8	9/16	1/2	7/16
													Inserts required for standard tubular diameters shown in bold font. REPLACEMENT DOVETAIL INSERTS for TONG JAWS are 1 1/4" wide x 3 7/8" long (4 pcs required per tong jaw set). REPLACEMENT DOVETAIL INSERTS for BACKUP DOVETAIL DIE ADAPTERS are 1 1/4" wide x 3 7/8" long (6 pcs required per backup dovetail die adapter set.)							
			10 3/4" casing																	
7	1	set of 2 pcs	tong jaw	10 3/4" tong jaw set w/ 1/2 dovetail strip dies	CJDT10-1075	na	na	1/2	3 7/8	CRSS10025-107	CRSS10026-107	10.750	dovetail gripping size>	10.125	10.250	10.375	10.500	10.625	**10.750**	10.875
9	3	each	backup die f/ tubular	11 3/4" x 10 3/4" splined adapter w/ 1/2" dovetail strip dies (f/ 10 3/4" csg)	na	na	BUDT11-1075	1/2	3 7/8			10.750	dovetail gripping size>	10.125	10.250	10.375	10.500	10.625	**10.750**	10.875
10	3	each	backup die f/ 11 3/4" OD coupling	11 3/4" x 11 3/4" splined adapter w/ 1/2" dovetail strip dies (f 10 3/4" cplg)	na	na	BUDT11-1175	1/2	3 7/8			11.750	dovetail gripping size>	11.125	11.250	11.375	11.500	11.625	**11.750**	11.875
			9 5/8" casing																	
11	1	set of 2 pcs	tong jaw	10 3/4" tong jaw set w/ 1/2 dovetail strip dies	CJDT10-0962	na	na	1/2	3 7/8	CRSS10025-096	CRSS10026-096	9.625	dovetail gripping size>	9.000	9.125	9.250	9.375	9.500	**9.625**	9.750
13	3	each	backup die f/ tubular	11 3/4" x 9 5/8" splined adapter w/ 1/2" dovetail strip dies (f/ 9 5/8" csg & 8 5/8" cplg)	na	na	BUDT11-0962	1/2	3 7/8			9.625	dovetail gripping size>	9.000	9.125	9.250	9.375	9.500	**9.625**	9.750
14	3	each	backup die f/ 10 5/8" OD coupling	11 3/4" x 10 5/8" splined adapter w/ 1/2" dovetail strip dies (f/ 9 5/8" cplg)	na	na	BUDT11-1062	1/2	3 7/8			10.625	dovetail gripping size>	10.000	10.125	10.250	10.375	10.500	**10.625**	10.750
			8 5/8" casing																	
15	1	set of 2 pcs	tong jaw	10 3/4" tong jaw set w/ 1/2 dovetail strip dies	CJDT10-0862	na	na	1/2	3 7/8	CRSS10025-086	CRSS10026-086	8.625	dovetail gripping size>	8.000	8.125	8.250	8.375	8.500	**8.625**	8.750
17	3	each	backup die f/ tubular	11 3/4" x 8 5/8" splined adapter w/ 1/2" dovetail strip dies (f/ 8 5/8" csg & 7 5/8" cplg)	na	na	BUDT11-0862	1/2	3 7/8			8.625	dovetail gripping size>	8.000	8.125	8.250	8.375	8.500	**8.625**	8.750
18	3	each	backup die f/ 9 5/8" OD coupling	11 3/4" x 9 5/8" splined adapter w/ 1/2" dovetail strip dies (f/ 9 5/8" csg & 8 5/8" cplg)	na	na	BUDT11-0962	1/2	3 7/8			9.625	dovetail gripping size>	9.000	9.125	9.250	9.375	9.500	**9.625**	9.750
			7 5/8" casing																	
19	1	set of 2 pcs	tong jaw	10 3/4" low friction tong jaw set w/ 1/2 dovetail strip dies	CJLFDT10-0762	na	na	1/2	3 7/8	CRSS10025-076	CRSS10026-076	7.625	dovetail gripping size>	7.000	7.125	7.250	7.375	7.500	**7.625**	7.750
22	3	each	backup die f/ tubular	11 3/4" x 7-5/8" splined adapter w/ 1/2" dovetail strip dies (f/ 7 5/8 csg)	na	na	BUDT11-0762	1/2	3 7/8			7.625	dovetail gripping size>	7.000	7.125	7.250	7.375	7.500	**7.625**	7.750
23	3	each	backup die f/ 8 5/8" OD coupling	11 3/4" x 8 5/8" splined adapter w/ 1/2" dovetail strip dies (f/ 8 5/8" csg & 7 5/8" cplg)	na	na	BUDT11-0862	1/2	3 7/8			8.625	dovetail gripping size>	8.000	8.125	8.250	8.375	8.500	**8.625**	8.750
			7" casing																	
24	1	set of 2 pcs	tong jaw	10 3/4" low friction tong jaw set w/ 1/2 dovetail strip dies	CJLFDT10-0700	na	na	1/2	3 7/8	CRSS10025-070	CRSS10026-070	7.000	dovetail gripping size>	6.375	6.500	6.625	6.750	6.875	**7.000**	7.125
27	3	each	backup die f/ tubular	11 3/4" x 7" splined adapter w/ 1/2" dovetail strip dies (f/ 7 5/8 csg)	na	na	BUDT11-0700	1/2	3 7/8			7.000	dovetail gripping size>	6.375	6.500	6.625	6.750	6.875	**7.000**	7.125
28	3	each	backup die f/ 7.656" OD coupling	11 3/4" x 7.656" splined adapter w/ 1/2" dovetail strip dies (f/ 7 cplg)	na	na	BUDT11-0765	1/2	3 7/8			7.656	dovetail gripping size>	7.031	7.156	7.281	7.406	7.531	**7.656**	7.781
			6-5/8" casing																	
29	1	set of 2 pcs	tong jaw	10 3/4" low friction tong jaw set w/ 1/2 dovetail strip dies	CJLFDT10-062	na	na	1/2	3 7/8	CRSS10025-062	CRSS10026-062	6.625	dovetail gripping size>	6.000	6.125	6.250	6.375	6.500	**6.625**	6.750
32	3	each	backup die f/ tubular	11 3/4" x 6-5/8" splined adapter w/ 1/2" dovetail strip dies (f/ 6 5/8 csg)	na	na	BUDT11-062	1/2	3 7/8			6.625	dovetail gripping size>	6.000	6.125	6.250	6.375	6.500	**6.625**	6.750
33	3	each	backup die f/ 7.390" OD coupling	11 3/4" x 7.390" splined adapter w/ 1/2" dovetail strip dies (f/ 6 5/8 cplg)	na	na	BUDT11-0739	1/2	3 7/8			7.390	dovetail gripping size>	6.765	6.890	7.015	7.140	7.265	**7.390**	7.515
			5-1/2" casing																	
34	1	set of 2 pcs	tong jaw	10 3/4" low friction tong jaw set w/ 1/2 dovetail strip dies	CJLFDT10-055	na	na	1/2	3 7/8	CRSS10025-055	CRSS10026-055	5.500	dovetail gripping size>	4.875	5.000	5.125	5.250	5.375	**5.500**	5.625
37	3	each	backup die f/ tubular	11 3/4" x5 1/2" splined adapter w/ 1/2" dovetail strip dies (f/ 5 1/2 csg)	na	na	BUDT11-055	1/2	3 7/8			5.500	dovetail gripping size>	4.875	5.000	5.125	5.250	5.375	**5.500**	5.625
38	3	each	backup die f/ 6.050" OD coupling	11 3/4" x6.050" splined adapter w/ 1/2" dovetail strip dies (f/ 5 1/2 cplg)	na	na	BUDT11-060	1/2	3 7/8			6.050	dovetail gripping size>	5.425	5.550	5.675	5.800	5.925	**6.050**	6.175
			5" casing																	
39	1	set of 2 pcs	tong jaw	10 3/4" low friction tong jaw set w/ 1/2 dovetail strip dies	CJLFDT10-050	na	na	1/2	3 7/8	CRSS10025-050	CRSS10026-050	5.000	dovetail gripping size>	4.375	4.500	4.625	4.750	4.875	**5.000**	5.125
42	3	each	backup die f/ tubular	11 3/4" x5" splined adapter w/ 1/2" dovetail strip dies (f/ 5 csg)	na	na	BUDT11-050	1/2	3 7/8			5.000	dovetail gripping size>	4.375	4.500	4.625	4.750	4.875	**5.000**	5.125
43	3	each	backup die f/ 5.563" OD coupling	11 3/4" x 5.563" splined adapter w/ 1/2" dovetail strip dies (f/ 5 cplg)	na	na	BUDT11-056	1/2	3 7/8			5.563	dovetail gripping size>	4.938	5.063	5.188	5.313	5.438	**5.563**	5.688
			4 1/2" tubing																	
44	1	set of 2 pcs	tong jaw	10 3/4" low friction tong jaw set w/ 1/2 dovetail strip dies	CJLFDT10-045	na	na	1/2	3 7/8	CRSS10025-045	CRSS10026-045	4.500	dovetail gripping size>	3.875	4.000	4.125	4.250	4.375	**4.500**	4.625
47	3	each	backup die f/ tubular	11 3/4" x5" splined adapter w/ 1/2" dovetail strip dies (f/ 5 csg)	na	na	BUDT11-045	1/2	3 7/8			4.500	dovetail gripping size>	3.875	4.000	4.125	4.250	4.375	**4.500**	4.625
49	3	each	backup die f/ 4 1/2" OD coupling	11 3/4" x 5.500" splined adapter w/ 1/2" dovetail strip dies (f/ 4 1/2 cplg)	na	na	BUDT11-055	1/2	3 7/8			5.500	dovetail gripping size>	4.875	5.000	5.125	5.250	5.375	**5.500**	5.625
			4" tubing																	
50	1	set of 2 pcs	tong jaw	10 3/4" low friction tong jaw set w/ 1/2 dovetail strip dies	CJLFDT10-040	na	na	1/2	3 7/8	CRSS10025-040	CRSS10026-040	4.000	dovetail gripping size>	3.375	3.500	3.625	3.750	3.875	**4.000**	4.125
53	3	each	backup die f/ tubular	11 3/4" x4" splined adapter w/ 1/2" dovetail strip dies (f/ 4 tbg)	na	na	BUDT11-040	1/2	3 7/8			4.000	dovetail gripping size>	3.375	3.500	3.625	3.750	3.875	**4.000**	4.125
55	3	each	backup die f/ 5.000" OD coupling	11 3/4" x 5.000" splined adapter w/ 1/2" dovetail strip dies (f/ 4 cplg)	na	na	BUDT11-050	1/2	3 7/8			5.000	dovetail gripping size>	4.375	4.500	4.625	4.750	4.875	**5.000**	5.125
			3-1/2" tubing																	
56	1	set of 2 pcs	tong jaw	10 3/4" low friction tong jaw set w/ 1/2 dovetail strip dies	CJLFDT10-035	na	na	1/2	3 7/8	CRSS10025-035	CRSS10026-035	3.500	dovetail gripping size>	2.875	3.000	3.125	3.250	3.375	**3.500**	3.625
59	3	each	backup die f/ tubular	11 3/4" x3 1/2" splined adapter w/ 1/2" dovetail strip dies (f/ 3 1/2 tbg)	na	na	BUDT11-035	1/2	3 7/8			3.500	dovetail gripping size>	2.875	3.000	3.125	3.250	3.375	**3.500**	3.625
60	3	each	backup die f/4.500" OD coupling	11 3/4" x 5.450" splined adapter w/ 1/2" dovetail strip dies (f/ 3 1/2 cplg)	na	na	BUDT11-045	1/2	3 7/8			4.500	dovetail gripping size>	3.875	4.000	4.125	4.250	4.375	**4.500**	4.625
			2-7/8" tubing																	
61	1	set of 2 pcs	tong jaw	10 3/4" low friction tong jaw set w/ 1/2 dovetail strip dies	CJLFDT10-028	na	na	1/2	3 7/8	CRSS10025-028	CRSS10026-028	2.875	dovetail gripping size>	2.250	2.375	2.500	2.625	2.750	**2.875**	3.000
64	3	each	backup die f/ tubular	11 3/4" x 2 7/8" splined adapter w/ 1/2" dovetail strip dies (f/ 2 7/8 tbg)	na	na	BUDT11-028	1/2	3 7/8			2.875	dovetail gripping size>	2.250	2.375	2.500	2.625	2.750	**2.875**	3.000
65	3	each	backup die f/ 3.688" OD coupling	11 3/4" x 3.668" splined adapter w/ 1/2" dovetail strip dies (f/ 2 7/8 cplg)	na	na	BUDT11-036	1/2	3 7/8			3.688	dovetail gripping size>	3.063	3.188	3.313	3.438	3.563	**3.688**	3.813
			2-3/8" tubing																	
66	1	set of 2 pcs	tong jaw	10 3/4" low friction tong jaw set w/ 1/2 dovetail strip dies	CJLFDT10-023	na	na	1/2	3 7/8	CRSS10025-023	CRSS10026-023	2.375	dovetail gripping size>	1.750	1.875	2.000	2.125	2.250	**2.375**	2.500
69	3	each	backup die f/ tubular	11 3/4" x 2 3/8" splined adapter w/ 1/2" dovetail strip dies (f/ 2 3/8 tbg)	na	na	BUDT11-028	1/2	3 7/8			2.375	dovetail gripping size>	1.750	1.875	2.000	2.125	2.250	**2.375**	2.500
70	3	each	backup die f/ 3.062" OD coupling	11 3/4" x 3.062" splined adapter w/ 1/2" dovetail strip dies (f/2 3/8 cplg)	na	na	BUDT11-030	1/2	3 7/8			3.062	dovetail gripping size>	2.437	2.562	2.687	2.812	2.937	**3.062**	3.187

NOTE: Coupling dimensions listed above are API nominal dimensions for STC, LTC, or BTC Casing
10 3/4" through 5" inclusive. Coupling dimensions shown for 4 1/2" and smaller tubing are for
External Upset connections. Die sizes should be matched to coupling O.D.'s to provide optimum
performance with minimal marking. Special die sizes must be used with non standard premium
connections.

(note 1) jaws, jaw adapters and dies are not normally required for this upset integral joint connection
(note 2) part number shown for jaws and adapters using wrap around dies is for basic part without dies. dies must be ordered separately.
(note 2) part number shown for fine tooth wrap around steel dies only. Contact Superior Mfg for **GRIT FACE™** and aluminum die availability.

JAWS & ADAPTERS WITH DOVETAIL DIES

Ref Line No	Qty Reqd	Unit	Tubular Product &Tong or Backup Components	Description	CLINCHER® Strip Die Jaw or Adapter Part Number (Note 2)	CLINCHER® Splined Jaw or Adapter Part Number (Note 2)	CLINCHER® DOVETAIL or Wraparound Die Part Number	standard dovetail die thickness required	dovetail die overall length required	Upper Guide Plate Part No.	Lower Guide Plate Part No.
			10 3/4" casing								
7	1	set of 2 pcs	tong jaw	10 3/4" tong jaw set w/ 1/2 dovetail strip dies	CJDT10-1075	na	na	1/2	3 7/8	CRSS10025-107	CRSS10026-107
9	3	each	backup die f/ tubular	11 3/4" x 10 3/4" splined adapter w/ 1/2" dovetail strip dies (f/ 10 3/4" csg)	na	na	BUDT11-1075	1/2	3 7/8		
10	3	each	backup die f/ 11 3/4" OD coupling	11 3/4" x 11 3/4" splined adapter w/ 1/2" dovetail strip dies (f 10 3/4" cplg)	na	na	BUDT11-1175	1/2	3 7/8		
			9 5/8" casing								
11	1	set of 2 pcs	tong jaw	10 3/4" tong jaw set w/ 1/2 dovetail strip dies	CJDT10-0962	na	na	1/2	3 7/8	CRSS10025-096	CRSS10026-096
13	3	each	backup die f/ tubular	11 3/4" x 9 5/8" splined adapter w/ 1/2" dovetail strip dies (f/ 9 5/8" csg & 8 5/8" cplg)	na	na	BUDT11-0962	1/2	3 7/8		
14	3	each	backup die f/ 10 5/8" OD coupling	11 3/4" x 10 5/8" splined adapter w/ 1/2" dovetail strip dies (f/ 9 5/8" cplg)	na	na	BUDT11-1062	1/2	3 7/8		
			8 5/8" casing								
15	1	set of 2 pcs	tong jaw	10 3/4" tong jaw set w/ 1/2 dovetail strip dies	CJDT10-0862	na	na	1/2	3 7/8	CRSS10025-086	CRSS10026-086
17	3	each	backup die f/ tubular	11 3/4" x 8 5/8" splined adapter w/ 1/2" dovetail strip dies (f/ 8 5/8" csg & 7 5/8" cplg)	na	na	BUDT11-0862	1/2	3 7/8		
18	3	each	backup die f/ 9 5/8" OD coupling	11 3/4" x 9 5/8" splined adapter w/ 1/2" dovetail strip dies (f/ 9 5/8" csg & 8 5/8" cplg)	na	na	BUDT11-0962	1/2	3 7/8		
			7 5/8" casing								
19	1	set of 2 pcs	tong jaw	10 3/4" low friction tong jaw set w/ 1/2 dovetail strip dies	CJLFDT10-0762	na	na	1/2	3 7/8	CRSS10025-076	CRSS10026-076
22	3	each	backup die f/ tubular	11 3/4" x 7-5/8" splined adapter w/ 1/2" dovetail strip dies (f/ 7 5/8 csg)	na	na	BUDT11-0762	1/2	3 7/8		
23	3	each	backup die f/ 8 5/8" OD coupling	11 3/4" x 8 5/8" splined adapter w/ 1/2" dovetail strip dies (f/ 8 5/8" csg & 7 5/8" cplg)	na	na	BUDT11-0862	1/2	3 7/8		
			7" casing								
24	1	set of 2 pcs	tong jaw	10 3/4" low friction tong jaw set w/ 1/2 dovetail strip dies	CJLFDT10-0700	na	na	1/2	3 7/8	CRSS10025-070	CRSS10026-070
27	3	each	backup die f/ tubular	11 3/4" x 7" splined adapter w/ 1/2" dovetail strip dies (f/ 7 5/8 csg)	na	na	BUDT11-0700	1/2	3 7/8		
28	3	each	backup die f/ 7.656" OD coupling	11 3/4" x 7.656" splined adapter w/ 1/2" dovetail strip dies (f/ 7 cplg)	na	na	BUDT11-0765	1/2	3 7/8		
			6-5/8" casing								
29	1	set of 2 pcs	tong jaw	10 3/4" low friction tong jaw set w/ 1/2 dovetail strip dies	CJLFDT10-062	na	na	1/2	3 7/8	CRSS10025-062	CRSS10026-062
32	3	each	backup die f/ tubular	11 3/4" x 6-5/8" splined adapter w/ 1/2" dovetail strip dies (f/ 6 5/8 csg)	na	na	BUDT11-062	1/2	3 7/8		
33	3	each	backup die f/ 7.390" OD coupling	11 3/4" x 7.390" splined adapter w/ 1/2" dovetail strip dies (f/ 6 5/8 cplg)	na	na	BUDT11-0739	1/2	3 7/8		
			5-1/2" casing								
34	1	set of 2 pcs	tong jaw	10 3/4" low friction tong jaw set w/ 1/2 dovetail strip dies	CJLFDT10-055	na	na	1/2	3 7/8	CRSS10025-055	CRSS10026-055
37	3	each	backup die f/ tubular	11 3/4" x5 1/2" splined adapter w/ 1/2" dovetail strip dies (f/ 5 1/2 csg)	na	na	BUDT11-055	1/2	3 7/8		
38	3	each	backup die f/ 6.050" OD coupling	11 3/4" x6.050" splined adapter w/ 1/2" dovetail strip dies (f/ 5 1/2 cplg)	na	na	BUDT11-060	1/2	3 7/8		
			5" casing								
39	1	set of 2 pcs	tong jaw	10 3/4" low friction tong jaw set w/ 1/2 dovetail strip dies	CJLFDT10-050	na	na	1/2	3 7/8	CRSS10025-050	CRSS10026-050
42	3	each	backup die f/ tubular	11 3/4" x5" splined adapter w/ 1/2" dovetail strip dies (f/ 5 csg)	na	na	BUDT11-050	1/2	3 7/8		
43	3	each	backup die f/ 5.563" OD coupling	11 3/4" x 5.563" splined adapter w/ 1/2" dovetail strip dies (f/ 5 cplg)	na	na	BUDT11-056	1/2	3 7/8		
			4 1/2" tubing								
44	1	set of 2 pcs	tong jaw	10 3/4" low friction tong jaw set w/ 1/2 dovetail strip dies	CJLFDT10-045	na	na	1/2	3 7/8	CRSS10025-045	CRSS10026-045
47	3	each	backup die f/ tubular	11 3/4" x5" splined adapter w/ 1/2" dovetail strip dies (f/ 5 csg)	na	na	BUDT11-045	1/2	3 7/8		
49	3	each	backup die f/ 4 1/2" OD coupling	11 3/4" x 5.500" splined adapter w/ 1/2" dovetail strip dies (f/ 4 1/2 cplg)	na	na	BUDT11-055	1/2	3 7/8		
			4" tubing								
50	1	set of 2 pcs	tong jaw	10 3/4" low friction tong jaw set w/ 1/2 dovetail strip dies	CJLFDT10-040	na	na	1/2	3 7/8	CRSS10025-040	CRSS10026-040
53	3	each	backup die f/ tubular	11 3/4" x4" splined adapter w/ 1/2" dovetail strip dies (f/ 4 tbg)	na	na	BUDT11-040	1/2	3 7/8		
55	3	each	backup die f/ 5.000" OD coupling	11 3/4" x 5.000" splined adapter w/ 1/2" dovetail strip dies (f/ 4 cplg)	na	na	BUDT11-050	1/2	3 7/8		
			3-1/2" tubing								
56	1	set of 2 pcs	tong jaw	10 3/4" low friction tong jaw set w/ 1/2 dovetail strip dies	CJLFDT10-035	na	na	1/2	3 7/8	CRSS10025-035	CRSS10026-035
59	3	each	backup die f/ tubular	11 3/4" x3 1/2" splined adapter w/ 1/2" dovetail strip dies (f/ 3 1/2 tbg)	na	na	BUDT11-035	1/2	3 7/8		
60	3	each	backup die f/4.500" OD coupling	11 3/4" x 5.450" splined adapter w/ 1/2" dovetail strip dies (f/ 3 1/2 cplg)	na	na	BUDT11-045	1/2	3 7/8		
			2-7/8" tubing								
61	1	set of 2 pcs	tong jaw	10 3/4" low friction tong jaw set w/ 1/2 dovetail strip dies	CJLFDT10-028	na	na	1/2	3 7/8	CRSS10025-028	CRSS10026-028
64	3	each	backup die f/ tubular	11 3/4" x 2 7/8" splined adapter w/ 1/2" dovetail strip dies (f/ 2 7/8 tbg)	na	na	BUDT11-028	1/2	3 7/8		
65	3	each	backup die f/ 3.688" OD coupling	11 3/4" x 3.668" splined adapter w/ 1/2" dovetail strip dies (f/ 2 7/8 cplg)	na	na	BUDT11-036	1/2	3 7/8		
			2-3/8" tubing								
66	1	set of 2 pcs	tong jaw	10 3/4" low friction tong jaw set w/ 1/2 dovetail strip dies	CJLFDT10-023	na	na	1/2	3 7/8	CRSS10025-023	CRSS10026-023
69	3	each	backup die f/ tubular	11 3/4" x 2 3/8" splined adapter w/ 1/2" dovetail strip dies (f/ 2 3/8 tbg)	na	na	BUDT11-028	1/2	3 7/8		
70	3	each	backup die f/ 3.062" OD coupling	11 3/4" x 3.062" splined adapter w/ 1/2" dovetail strip dies (f/2 3/8 cplg)	na	na	BUDT11-030	1/2	3 7/8		

JAWS & ADAPTERS WITH DOVETAIL DIES

Ref Line No	Qty Reqd	Unit	Tubular Product &Tong or Backup Components	Description	CLINCHER® Strip Die Jaw or Adapter Part Number (Note 2)	CLINCHER® Splined Jaw or Adapter Part Number (Note 2)	CLINCHER® DOVETAIL or Wraparound Die Part Number	standard dovetail die thickness required	dovetail die overall length required	Upper Guide Plate Part No.	Lower Guide Plate Part No.	
			NOTE: Coupling dimensions listed above are API nominal dimensions for STC, LTC, or BTC Casing									
			10 3/4" through 5" inclusive. Coupling dimensions shown for 4 1/2" and smaller tubing are for									
			External Upset connections. Die sizes should be matched to coupling O.D.'s to provide optimum									
			performance with minimal marking. Special die sizes must be used with non standard premium									
			connections.									
			(note 1) jaws, jaw adapters and dies are not normally required for this upset integral joint connection									
			(note 2) part number shown for jaws and adapters using wrap around dies is for basic part without dies. dies must be ordered separately.									
			(note 2) part number shown for fine tooth wrap around steel dies only. Contact Superior Mfg for **GRIT FACE™** and aluminum die availablility.									

JAWS & ADAPTERS WITH DOVETAIL DIES

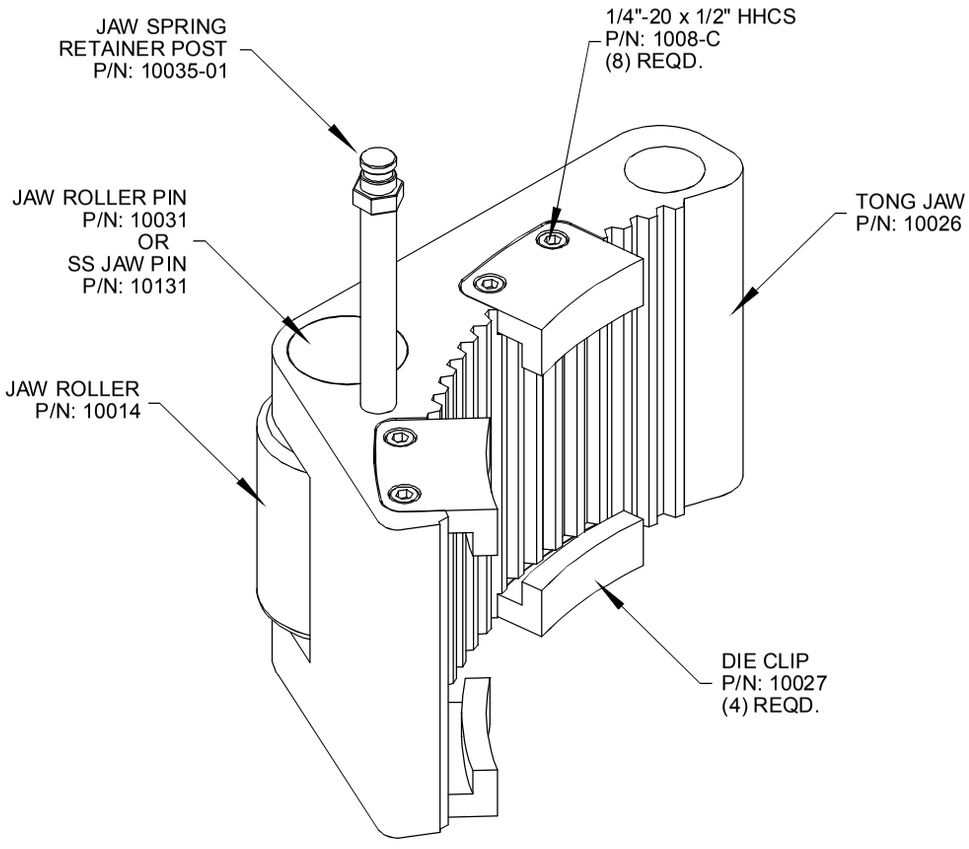
nominal jaw & adapter sizes	dovetail die part number for 3 7/8" overall length>	DTI1661	DTI1651	DTI1642	DTI1632	DTI1622	DTI1601	DTI1612
	dovetail die thickness>	13/16	3/4	11/16	5/8	9/16	**1/2**	7/16
Inserts required for standard tubular diameters shown in bold font. REPLACEMENT DOVETAIL INSERTS for TONG JAWS are 1 1/4" wide x 3 7/8" long (4 pcs required per tong jaw set). REPLACEMENT DOVETAIL INSERTS for BACKUP DOVETAIL DIE ADAPTERS are 1 1/4" wide x 3 7/8" long (6 pcs required per backup dovetail die adapter set.)								
10.750	dovetail gripping size>	10.125	10.250	10.375	10.500	10.625	**10.750**	10.875
10.750	dovetail gripping size>	10.125	10.250	10.375	10.500	10.625	**10.750**	10.875
11.750	dovetail gripping size>	11.125	11.250	11.375	11.500	11.625	**11.750**	11.875
9.625	dovetail gripping size>	9.000	9.125	9.250	9.375	9.500	**9.625**	9.750
9.625	dovetail gripping size>	9.000	9.125	9.250	9.375	9.500	**9.625**	9.750
10.625	dovetail gripping size>	10.000	10.125	10.250	10.375	10.500	**10.625**	10.750
8.625	dovetail gripping size>	8.000	8.125	8.250	8.375	8.500	**8.625**	8.750
8.625	dovetail gripping size>	8.000	8.125	8.250	8.375	8.500	**8.625**	8.750
9.625	dovetail gripping size>	9.000	9.125	9.250	9.375	9.500	**9.625**	9.750
7.625	dovetail gripping size>	7.000	7.125	7.250	7.375	7.500	**7.625**	7.750
7.625	dovetail gripping size>	7.000	7.125	7.250	7.375	7.500	**7.625**	7.750
8.625	dovetail gripping size>	8.000	8.125	8.250	8.375	8.500	**8.625**	8.750
7.000	dovetail gripping size>	6.375	6.500	6.625	6.750	6.875	**7.000**	7.125
7.000	dovetail gripping size>	6.375	6.500	6.625	6.750	6.875	**7.000**	7.125
7.656	dovetail gripping size>	7.031	7.156	7.281	7.406	7.531	**7.656**	7.781
6.625	dovetail gripping size>	6.000	6.125	6.250	6.375	6.500	**6.625**	6.750
6.625	dovetail gripping size>	6.000	6.125	6.250	6.375	6.500	**6.625**	6.750
7.390	dovetail gripping size>	6.765	6.890	7.015	7.140	7.265	**7.390**	7.515
5.500	dovetail gripping size>	4.875	5.000	5.125	5.250	5.375	**5.500**	5.625
5.500	dovetail gripping size>	4.875	5.000	5.125	5.250	5.375	**5.500**	5.625
6.050	dovetail gripping size>	5.425	5.550	5.675	5.800	5.925	**6.050**	6.175
5.000	dovetail gripping size>	4.375	4.500	4.625	4.750	4.875	**5.000**	5.125
5.000	dovetail gripping size>	4.375	4.500	4.625	4.750	4.875	**5.000**	5.125
5.563	dovetail gripping size>	4.938	5.063	5.188	5.313	5.438	**5.563**	5.688
4.500	dovetail gripping size>	3.875	4.000	4.125	4.250	4.375	**4.500**	4.625
4.500	dovetail gripping size>	3.875	4.000	4.125	4.250	4.375	**4.500**	4.625
5.500	dovetail gripping size>	4.875	5.000	5.125	5.250	5.375	**5.500**	5.625
4.000	dovetail gripping size>	3.375	3.500	3.625	3.750	3.875	**4.000**	4.125
4.000	dovetail gripping size>	3.375	3.500	3.625	3.750	3.875	**4.000**	4.125
5.000	dovetail gripping size>	4.375	4.500	4.625	4.750	4.875	**5.000**	5.125
3.500	dovetail gripping size>	2.875	3.000	3.125	3.250	3.375	**3.500**	3.625
3.500	dovetail gripping size>	2.875	3.000	3.125	3.250	3.375	**3.500**	3.625
4.500	dovetail gripping size>	3.875	4.000	4.125	4.250	4.375	**4.500**	4.625
2.875	dovetail gripping size>	2.250	2.375	2.500	2.625	2.750	**2.875**	3.000
2.875	dovetail gripping size>	2.250	2.375	2.500	2.625	2.750	**2.875**	3.000
3.688	dovetail gripping size>	3.063	3.188	3.313	3.438	3.563	**3.688**	3.813
2.375	dovetail gripping size>	1.750	1.875	2.000	2.125	2.250	**2.375**	2.500
2.375	dovetail gripping size>	1.750	1.875	2.000	2.125	2.250	**2.375**	2.500
3.062	dovetail gripping size>	2.437	2.562	2.687	2.812	2.937	**3.062**	3.187

JAWS & ADAPTERS FOR WRAP-AROUND DIES

item no	qty reqd	unit	tubular product & tong or backup components	description	CLINCHER® strip die jaw or adapter part number (note 2)	CLINCHER® wrap around jaw or adapter part number (note 2)	CLINCHER® wrap around die part number (note3)	standard dovetail die thickness required	dovetail die overall length required	Upper Guide Plate Part No.	Lower Guide Plate Part No.
			10 3/4" casing								
7	1	set of 2 pcs	tong jaw	10 3/4" splined tong jaw set	na	CJ-10A		na	na	CRSS10025-107	CRSS10026-107
8	2	each	tong die f/ tubular	10 3/4" x 10 3/4" **CLINCHER®** dies (f/ 10 3/4" csg)	na		CLE10751075	na	na		
9	3	each	backup die f/ tubular	11 3/4" x 10 3/4" **CLINCHER®** dies (f/ 10 3/4" csg)	na		CLE1175 1075	na	na		
10	3	each	backup die f/ 11 3/4" OD coupling	11 3/4" x 11 3/4" **CLINCHER®** dies (f 10 3/4" cplg)	na		CLE1175 1175	na	na		
			9 5/8" casing								
11	1	set of 2 pcs	tong jaw	10 3/4" splined tong jaw set	na	CJ-10A		na	na	CRSS10025-096	CRSS10026-096
12	2	each	tong die f/ tubular	10 3/4" x 9 5/8"**CLINCHER®** dies (f/ 9 5/8" csg & 8 5/8" cplg)	na		CLE1075 9625	na	na		
13	3	each	backup die f/ tubular	11 3/4" x 9 5/8" **CLINCHER®** dies (f/ 9 5/8" csg & 8 5/8" cplg)	na		CLE1175 9625	na	na		
14	3	each	backup die f/ 10 5/8" OD coupling	11 3/4" x 10 5/8" **CLINCHER®** dies (f/ 9 5/8" cplg)	na		CLE1175 1063	na	na		
			8 5/8" casing								
15	1	set of 2 pcs	tong jaw	10 3/4" splined tong jaw set	na	CJ-10A		na	na	CRSS10025-086	CRSS10026-086
16	2	each	tong die f/ tubular	10 3/4" x 8 5/8" **CLINCHER®** dies (f/ 8 5/8" csg & 7 5/8" cplg)	na		CLE1075 8625	na	na		
17	3	each	backup die f/ tubular	11 3/4" x 8 5/8" **CLINCHER®** dies (f/ 8 5/8" csg & 7 5/8" cplg)	na		CLE11758625	na	na		
18	3	each	backup die f/ 9 5/8" OD coupling	11 3/4" x 9 5/8" **CLINCHER®** dies (f/ 9 5/8" csg & 8 5/8" cplg)	na		CLE1175 9625	na	na		
			7 5/8" casing								
19	1	set of 2 pcs	tong jaw	10 3/4" splined low friction tong jaw set	na	CJ-LF-10A		na	na	CRSS10025-076	CRSS10026-076
20	2	each	tong die f/ tubular	10 3/4" x 7 5/8" **CLINCHER®** Low Friction wrap around die	na		CLF10757625	na	na		
21	3	each	backup adapter	11 3/4" x 7 5/8" **CLINCHER®** splined adapter	na		CBA1175 7625	na	na		
22	3	each	backup die f/ tubular	7-5/8" x 7-5/8" **CLINCHER®** wrap around die	na		BUC76257625	na	na		
23	3	each	backup die f/ 8 5/8" OD coupling	11 3/4" x 8 5/8" **CLINCHER®** wrap around die (f/ 8 5/8" csg & 7 5/8" cplg)	na		CLE1175 8625	na	na		
			7" casing								
24	1	set of 2 pcs	tong jaw	10 3/4" splined low friction tong jaw set	na	CJ-LF-10A		na	na	CRSS10025-070	CRSS10026-070
25	2	each	tong die f/ tubular	10 3/4" x 7" **CLINCHER®** Low Friction wrap around die	na		CLF10757000	na	na		
26	3	each	backup adapter	11-3/4" X 7-5/8" splined adapter	na	CBA11757625		na	na		
27	3	each	backup die f/ tubular	7 5/8" x 7" **CLINCHER®** wrap around die	na		BUC76257000	na	na		
28	3	each	backup die f/ 7.656" OD coupling	7 5/8" x 7.656" **CLINCHER®** wrap around die (f/ 7" cplg)	na		BUC76257656	na	na		
			6-5/8" casing								
29	1	set of 2 pcs	tong jaw	10 3/4" splined low friction tong jaw set	na	CJ-LF-10A		na	na	CRSS10025-062	CRSS10026-062
30	2	each	tong die f/ tubular	10 3/4" x 6-5/8" **CLINCHER®** Low Friction wrap around die	na		CLF10756625	na	na		
31	3	each	backup adapter	11-3/4" X 7-5/8" splined adapter	na	CBA11757625		na	na		
32	3	each		7 5/8" x 6-5/8" **CLINCHER®** wrap around die	na		BUC76256625	na	na		
33	3	each	backup die f/ 7.390" OD coupling	7 5/8" x 7.390" **CLINCHER®** wrap around die (f/ 6-5/8" cplg)	na		BUC76257390	na	na		
			5-1/2" casing								
34	1	set of 2 pcs	tong jaw	10 3/4" splined low friction tong jaw set	na	CJ-LF-10A		na	na	CRSS10025-055	CRSS10026-055
35	2	each	tong die f/ tubular	10 3/4 x 5-1/2" **CLINCHER®** Low Friction wrap around die	na		CLF10755500	na	na		
36	3	each	backup adapter	11-3/4" X 7-5/8" splined adapter	na	CBA11757625		na	na		
37	3	each	backup die f/ tubular	7 5/8" x 5-1/2" **CLINCHER®** wrap around die	na		BUC76255500	na	na		
38	3	each	backup die f/ 6.050" OD coupling	7 5/8" x 6.050" **CLINCHER®** wrap around die (f/ 5-1/2" cplg)	na		BUC76256050	na	na		
			5" casing								
39	1	set of 2 pcs	tong jaw	10 3/4" splined low friction tong jaw set	na	CJ-LF-10A		na	na	CRSS10025-050	CRSS10026-050
40	2	each	tong die f/ tubular	10 3/4" x 5" **CLINCHER®** Low Friction wrap around die	na		CLF10755000	na	na		
41	3	each	backup adapter	11-3/4" X 7-5/8" splined adapter	na	CBA11757625		na	na		
42	3	each	backup die f/ tubular	7 5/8" x 5" **CLINCHER®** wrap around die	na		BUC76255000	na	na		
43	3	each	backup die f/ 5.563" OD coupling	7 5/8" x 5.563" **CLINCHER®** wrap around die (f/ 5" cplg)	na		BUC76255563	na	na		
			4 1/2" tubing								
44	1	set of 2 pcs	tong jaw	10 3/4" splined low friction tong jaw set	na	CJ-LF-10A		na	na	CRSS10025-045	CRSS10026-045
45	2	each	tong die f/ tubular	10 3/4" x 4 1/2" **CLINCHER®** Low Friction wrap around die	na		CLF10754500	na	na		
46	3	each	backup adapter	11-3/4" X 4-1/2" splined adapter	na	CBA11754500		na	na		
47	3	each	backup die f/ tubular	4-1/2" x 4 1/2" **CLINCHER®** wrap around die	na		BUC45004500	na	na		
48	3	each	backup adapter	11-3/4" X 7-5/8" splined adapter	na	CBA11757625		na	na		
49	3	each	backup die f/ 5 1/2" OD coupling	7 5/8" x 5 1/2" **CLINCHER®** wrap around die (f/ 4 1/2" cplg)	na		BUC76255500	na	na		

JAWS & ADAPTERS FOR WRAP-AROUND DIES

item no	qty reqd	unit	tubular product & tong or backup components	description	CLINCHER® strip die jaw or adapter part number (note 2)	CLINCHER® wrap around jaw or adapter part number (note 2)	CLINCHER® wrap around die part number (note3)	standard dovetail die thickness required	dovetail die overall length required	Upper Guide Plate Part No.	Lower Guide Plate Part No.
			4" tubing								
50	1	set of 2 pcs	tong jaw	10 3/4" splined low friction tong jaw set	na	CJ-LF-10A		na	na	CRSS10025-040	CRSS10026-040
51	2	each	tong die f/ tubular	10 3/4" x 4" **CLINCHER®** Low Friction wrap around die	na		CLF10754000	na	na		
52	3	each	backup adapter	11-3/4" X 4-1/2" splined adapter	na	CBA11754500		na	na		
53	3	each	backup die f/ tubular	4-1/2" x 4" **CLINCHER®** wrap around die	na		BUC45004000	na	na		
54	3	each	backup adapter	11-3/4" X 7-5/8" splined adapter	na	CBA11757625		na	na		
55	3	each	backup die f/ 5.000" OD coupling	7 5/8" x 5" **CLINCHER®** wrap around die (f/ 4" cplg)	na		BUC76255000	na	na		
			3-1/2" tubing								
56	1	set of 2 pcs	tong jaw	10 3/4" splined low friction tong jaw set	na	CJ-LF-10A		na	na	CRSS10025-035	CRSS10026-035
57	2	each	tong die f/ tubular	10 3/4" x 3-1/2" **CLINCHER®** Low Friction wrap around die	na		CLF10753500	na	na		
58	3	each	backup adapter	11-3/4" X 4-1/2" splined adapter	na	CBA11754500		na	na		
59	3	each	backup die f/ tubular	4-1/2" x 3-1/2" **CLINCHER®** wrap around die	na		BUC45003500	na	na		
60	3	each	backup die f/4.500" OD coupling	4-1/2" x 4 1/2" **CLINCHER®** wrap around die (f/ 3-1/2" cplg)	na		BUC45004500	na	na		
			2-7/8" tubing								
61	1	set of 2 pcs	tong jaw	10 3/4" splined low friction tong jaw set	na	CJ-LF-10A		na	na	CRSS10025-028	CRSS10026-028
62	2	each	tong die f/ tubular	10 3/4" x 2-7/8" **CLINCHER®** Low Friction wrap around die	na		CLF10752875	na	na		
63	3	each	backup adapter	11-3/4" X 4-1/2" splined adapter	na	CBA11754500		na	na		
64	3	each	backup die f/ tubular	4-1/2" x 2-7/8" **CLINCHER®** wrap around die	na		BUC45002875	na	na		
65	3	each	backup die f/ 3.500" OD coupling	4-1/2" x 3 1/2" **CLINCHER®** wrap around die (f/ 2-7/8" cplg)	na		BUC45003500	na	na		
			2-3/8" tubing								
66	1	set of 2 pcs	tong jaw	10 3/4" splined low friction tong jaw set	na	CJ-LF-10A		na	na	CRSS10025-023	CRSS10026-023
67	2	each	tong die f/ tubular	10 3/4" X 2-3/8" **CLINCHER®** Low Friction wrap around die	na		CLF10752375	na	na		
68	3	each	backup adapter	11-3/4" X 4-1/2" splined adapter	na	CBA11754500		na	na		
69	3	each	backup die f/ tubular	4-1/2" x 2-3/8" **CLINCHER®** wrap around die	na		BUC45002375	na	na		
70	3	each	backup die f/ 3.062" OD coupling	4-1/2" x 3.062" **CLINCHER®** wrap around die (f/ 2-3/8" cplg)	na		BUC45003062	na	na		
			NOTE: Coupling dimensions listed above are API nominal dimensions for STC, LTC, or BTC Casing								
			10 3/4" through 5" inclusive. Coupling dimensions shown for 4 1/2" and smaller tubing are for								
			External Upset connections. Die sizes should be matched to coupling O.D.'s to provide optimum								
			performance with minimal marking. Special die sizes must be used with non standard premium								
			connections.								
			(note 1) jaws, jaw adapters and dies are not normally required for this upset integral joint connection								
			(note 2) part number shown for jaws and adapters using wrap around dies is for basic part without dies. dies must be ordered separately.								
			(note 2) part number shown for fine tooth wrap around steel dies only. Contact Superior Mfg for **GRIT FACE™** and aluminum die availability.								



10 3/4" TONG JAW ASSEMBLY

2 REQUIRED PER SET

REGULAR JAW SET ASSEMBLY

10 3/4" ASSEMBLY NO. CJ-10B

JAW SET ASSEMBLY WITH SS PIN

10 3/4" ASSEMBLY NO. CJ-10A

SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
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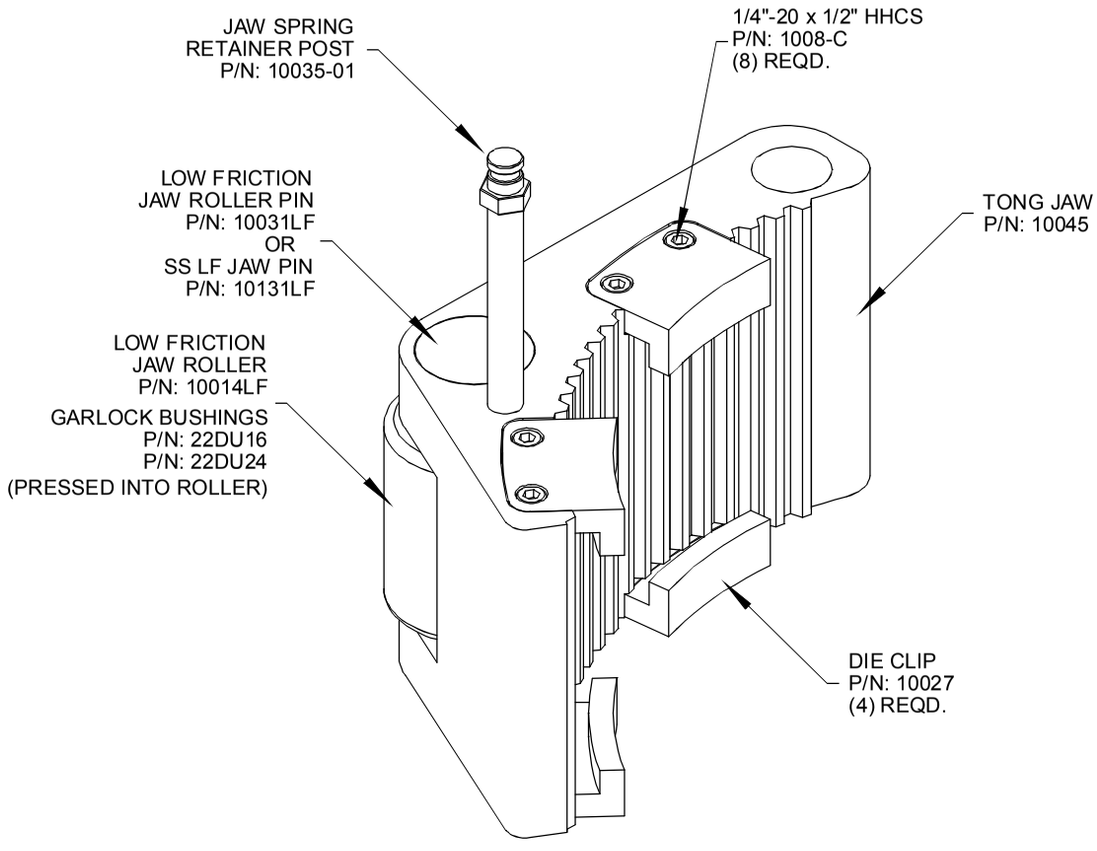

10 3/4" TONG LOW FRICTION JAW ASSEMBLY

2 REQUIRED PER SET

REGULAR JAW SET ASSEMBLY

10 3/4" ASSEMBLY NO. CJ-LF-10B

JAW SET ASSEMBLY WITH SS PIN

10 3/4" ASSEMBLY NO. CJ-LF-10A

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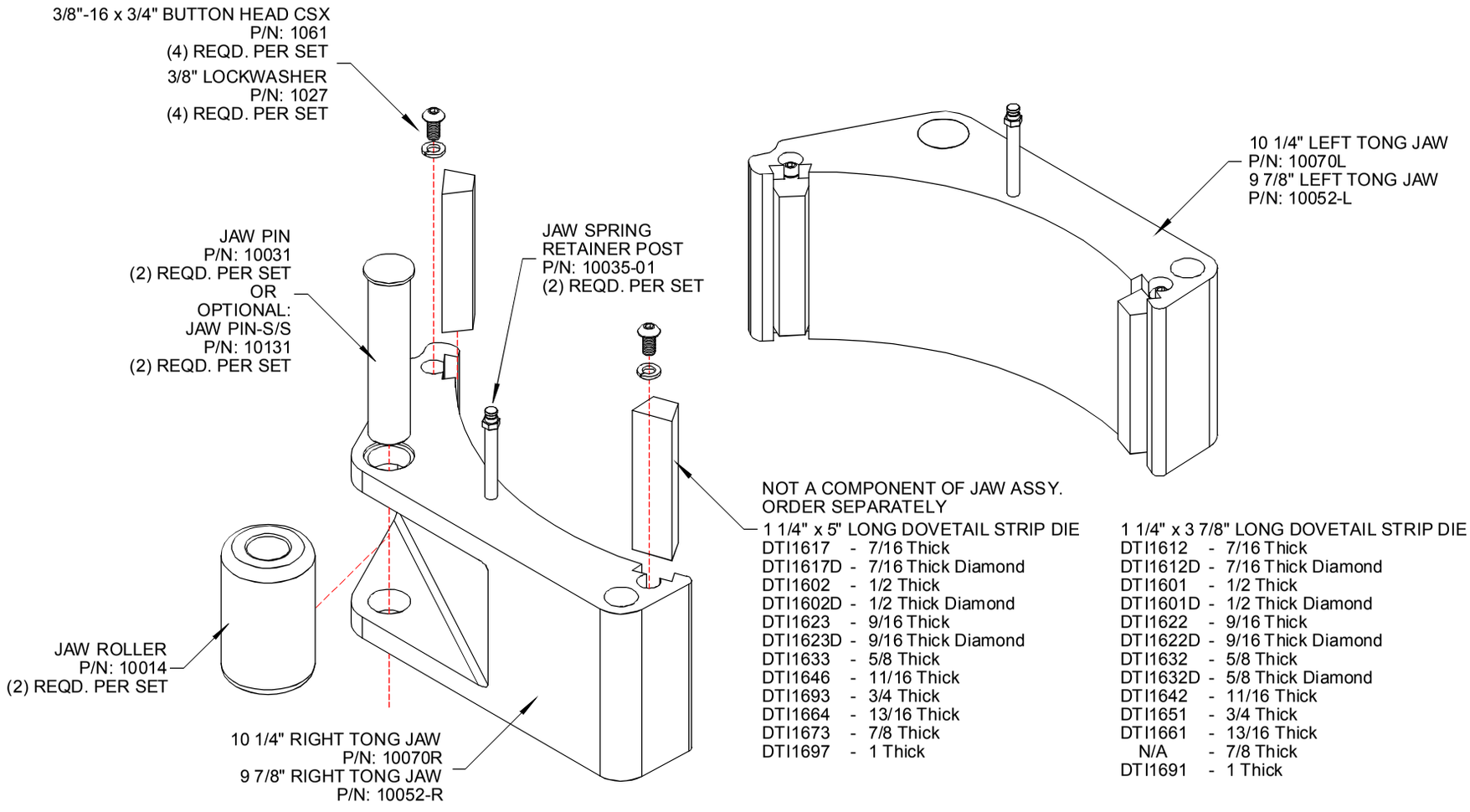

1 1/4" x 5" LONG DOVETAIL STRIP DIE

DTI1617	-	7/16 Thick
DTI1617D	-	7/16 Thick Diamond
DTI1602	-	1/2 Thick
DTI1602D	-	1/2 Thick Diamond
DTI1623	-	9/16 Thick
DTI1623D	-	9/16 Thick Diamond
DTI1633	-	5/8 Thick
DTI1646	-	11/16 Thick
DTI1693	-	3/4 Thick
DTI1664	-	13/16 Thick
DTI1673	-	7/8 Thick
DTI1697	-	1 Thick

1 1/4" x 3 7/8" LONG DOVETAIL STRIP DIE

DTI1612	-	7/16 Thick
DTI1612D	-	7/16 Thick Diamond
DTI1601	-	1/2 Thick
DTI1601D	-	1/2 Thick Diamond
DTI1622	-	9/16 Thick
DTI1622D	-	9/16 Thick Diamond
DTI1632	-	5/8 Thick
DTI1632D	-	5/8 Thick Diamond
DTI1642	-	11/16 Thick
DTI1651	-	3/4 Thick
DTI1661	-	13/16 Thick
N/A	-	7/8 Thick
DTI1691	-	1 Thick

10 3/4" TONG DOVETAIL JAW SET ASSEMBLY

REGULAR JAW SET ASSEMBLY

10 1/4" ASSEMBLY NO. CJDT10-1025R
9 7/8" ASSEMBLY NO. CJDT10-9875R

JAW SET ASSEMBLY WITH SS PIN

9 7/8" ASSEMBLY NO. CJDT10-9875

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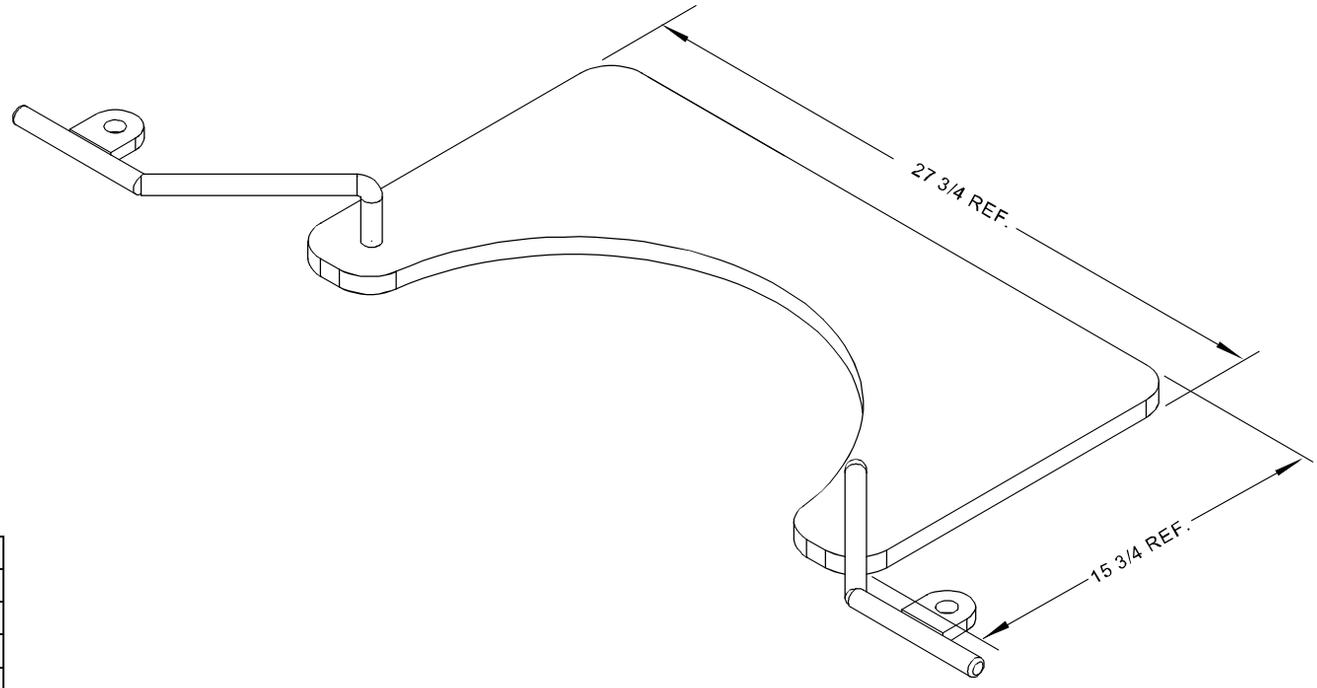

Part Number	Pipe Size
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CRSS10026-028	2 7/8
CRSS10026-035	3 1/2
CRSS10026-040	4
CRSS10026-045	4 1/2
CRSS10026-050	5
CRSS10026-055	5 1/2
CRSS10026-062	6 5/8
CRSS10026-070	7
CRSS10026-076	7 5/8
CRSS10026-086	8 5/8
CRSS10026-096	9 5/8
CRSS10026-107	10 3/4

BOTTOM GUIDE PLATE

SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

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		12/03/02
REV. #	LOG #	DATE

REF: S:\Equip Manuals\Dwgs\CRSS10750\Guide Plate B.wpg

Part Number	Pipe Size
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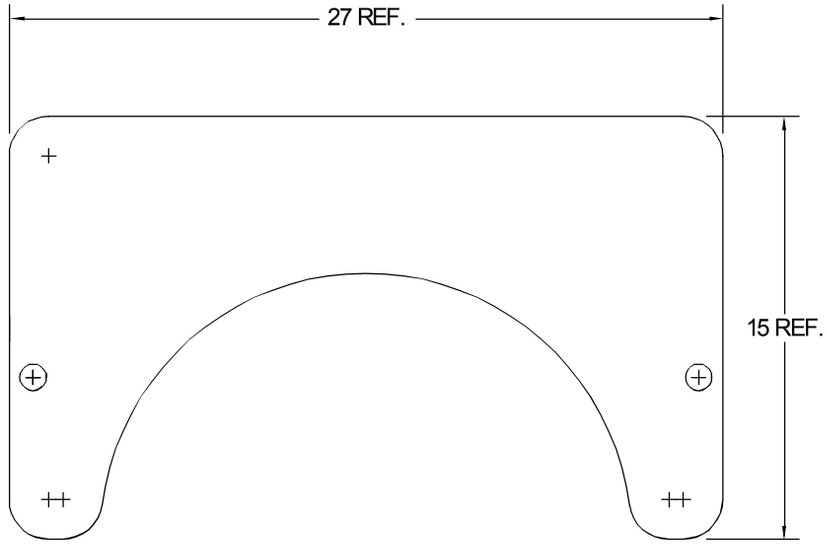
CRSS10025-028	2 7/8
CRSS10025-035	3 1/2
CRSS10025-040	4
CRSS10025-045	4 1/2
CRSS10025-050	5
CRSS10025-055	5 1/2
CRSS10025-062	6 5/8
CRSS10025-070	7
CRSS10025-076	7 5/8
CRSS10025-086	8 5/8
CRSS10025-096	9 5/8
CRSS10025-107	10 3/4



TOP GUIDE PLATE

SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
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REV. #	LOG #	DATE
		12/03/02

REF: S:\Equip Manuals\Dwgs\CRSS10750\Guide Plate T.wpg

ASSEMBLY INSTRUCTIONS

FASTENER LUBRICATION AND MAKE UP TORQUE REQUIREMENTS

Most bolts, nuts, and other threaded components are to be lubricated with Never-Seez or equivalent before assembly. Certain fasteners are to be assembled using permanent or removable Loctite as indicated in the assembly illustrations. All tapered pipe threads are to be treated with a Teflon based pipe dope to assist in makeup and prevent leakage.

CAUTION: Do not use teflon tape. Improper application of teflon tape can cause joint failures. Teflon tape can release large particles which can plug small passages in hydraulic equipment.

All standard fasteners used in **CLINCHER®** products are to be GRADE 8 or better. DO NOT SUBSTITUTE lesser grades of fasteners. All fasteners are to be made up to the torque charted below. Failure to properly assemble these fasteners can result in their loss, product malfunction, and ultimately result in situations where personnel can be exposed to dangerous situations.

TONG AND BACKUP FASTENERS		
Size	***Application***	***Torque***
1/4 - 20 NC	pivot pin cylinder	10 ft lbs
3/8 - 16 Set Screws	bearing caps	* [1]
3/8 - 16 NC	lower gear housing cover, remote pivot pin, brake cylinder, load cell brackets, clip bolts	33 ft lbs
1/2 - 13 NC	top secondary bearing cap, remote pivot pin center bolt, motor mounts, cage plate bolts	93 ft lbs
5/8 - 11 NC	tong plates, cam follower nuts, bearing caps	180 ft lbs
3/4 - 10 NC	backup plates, backup doors and center jaw	317 ft lbs
1 - 12 NF	dumbell roller	* [2]
1 1/2 - 12 NF	idler shaft	1,200 ft lbs

* [1] Coat with removable Loctite, tighten until screw contacts bearing, back off 1 turn.
* [2] Tighten until all slack is removed, but dumbell roller is still free to rotate by hand.

LUBRICATION STANDARDS

Bearings and gears must be lubricated to minimize friction, cool, exclude foreign matter, and prevent corrosion. **CLINCHER®** recommends using Texaco Marfak MP 2 or equivalent for all grease zerts, roller bearings, and bushings. Gears located within the clutch housing or between the tong plates are to be heavily lubricated using PLUSCO 855 or equivalent.

ASSEMBLY INSTRUCTIONS

TONG ASSEMBLY

This section pertains to the physical assembly of the **CLINCHER®** CLE1075 Power Tong. Section 9 illustrates the individual sub assemblies in more detail. The purpose of this section is to guide the technician in the order of assembly as we would accomplish in the manufacturing process at our plant. Use this section as a guide to help you familiarize yourself with the component parts of the CLE1075. We have included drawings on the following pages to aid in the assembly. The drawings are laid out in the order in which you would assemble/disassemble the unit.

Order of Assembly:

1. Locate suitable working height. Approximately 6" above your waist. Tong assembly stands are available from Superior Manufacturing & Hydraulics, Inc. which are custom made for tong service work.
2. Install bottom tong plate PN10001-01, on assembly stand.
3. Bolt CLE1075 tong mid body PN10010 to bottom tong plate PN10001-01, with (21) 5/8"-11 x 1 3/4" HHCS PN 1185 , (21) 5/8" lockwasher PN 1151 and (3) 5/8"-11 x 1" SHCS PN 1153.
4. Press bearing PN 1903 into bottom secondary bearing cap PN 55041. Install (2) 3/8"-16 x 1/2" set screw PN 1029 (use removable Loctite), and 3/4" NPT flush plug PN 1610.
5. Install bottom secondary bearing cap assembly with (4) 5/8"-11 x 1 3/4" HHCS PN 1157 with (4) 5/8" lockwasher PN 1151.
6. Press bearing PN 1902 into bottom pinion bearing cap PN 55036. Install (2) 3/8"-16 x 1/2" set screw PN 1029 (use removable Loctite), and 1/8" NPT flush plug PN 1607.
7. Install bottom pinion bearing cap assembly onto bottom tong plate PN 10001-01 with (4) 5/8"-11 x 1 1/4" HHCS PN 1156 and (4) 5/8" lockwasher PN 1151.
8. Dumbell Roller Assembly (*New Style):
   a) Install (2) 1/8" NPT zert PN 1001 on dumbell roller shaft PN 76025-A.
   b) Install 1"-12 low profile nylock nut PN 1213 onto dumbell roller shaft PN 76025-A.
   c) Press (1) bearing PN 1910-B into end of dumbell roller PN 2094.
   d) Fit spacer PN 55027-D into opposite end of dumbell roller PN 55025-A.
   e) Press (1) bearing PN 1910-B into end of dumbell roller PN 55025-A.
   f) Install (2) thrust washer PN 2095 onto each end of dumbell roller assembly.
9. Idler Gear Assembly:
   a) Press bearing PN 1905 into idler gear PN 76049.
   b) Press idler gear assembly onto idler shaft PN 76051-01.
   c) Install internal snap ring PN1926 on idler shaft.
   d) Install idler gear and shaft assembly into tong using (3) 5/8"-11 x 2" HHCS PN 1160 with (3) 5/8" lockwasher PN 1151. Bolt idler shaft PN 76051-01 with 1 1/2"-12 Nut PN 1222 and 1 1/2" lockwasher PN1223.
   e) Install 1/8" NPT zert PN 1001 at end of idler shaft PN 76051-01.

ASSEMBLY INSTRUCTIONS

10. Outboard Idler Gear Assembly: [3 Required Per Tong]
    a) Press bearing PN 1905 into idler gear PN 76049.
    b) Install (2) internal snap ring PN 1926 in idler gear PN 76049.
    c) Press idler gear assembly onto outboard idler shaft PN 76050-01.
    d) Install large end of shaft assembly and idler gear into bottom tong plate with 1 1/2"-12 nut PN 1222 and 1 1/2" lockwasher PN 1223.
    f) Install 1/8" NPT zert PN 1001 at end of idler shaft PN 76050-01.
11. Install ring gear PN 10009 into tong body making sure teeth in idler gears PN 76049 align with teeth in ring gear.
12. Install (14) dumbell roller assemblies around ring gear PN 10009 making sure holes in dumbell roller assemblies match up to holes in bottom tong plate PN10001-01.

    Hint: Temporarily install dumbbell roller shafts thru dumbbell roller assembly and bottom tong plate to control position.

Note: Newer tongs utilize different pinion and low pinion gears. These gears are *NOT* interchangeable and must be used in sets.

	STANDARD OLD P/N	***ALTERNATE OLD P/N***	***NEW P/N***
Pinion Gear	55038-01	55038-01	73038
Low Pinion Gear	55047	55047BJ	55161BJ
Pinion Bearing Bushing	55047-1	55047-1	14049
Secondary Input Gear	55048	55048BJ	55048BJ

13. Pinion Gear Assembly:
    a) Press pinion gear PN 55038-01 into bottom pinion bearing cap PN 55036 with bearing PN 1902 that is bolted to bottom tong plate PN 10001-01.
    b) Install low pinion gear PN 55047 onto pinion gear PN55038-01.
    c) Install bearing PN 1902 onto pinion gear PN 55038-01 and add pinion bearing bushing PN 55047-1.
14. Install secondary input gear PN 55048 into bearing PN 1903, which was previously installed into bottom retainer bearing cap PN 55041.
15. Install top tong plate PN10002-02 onto mid body PN10010 using (21) 5/8"-11 x 1 3/4" HHCS PN 1185, with 5/8" lockwasher PN 1151, and (3) 5/8"-11 x 1" SHCS PN 1153.
16. Press bearing PN 1900 into bearing retainer PN 55066. Install top bearing retainer assembly onto secondary input gear PN 55048. Bolt to top tong plate using (4) 5/8"-11 x 1 1/4" HHCS PN 1156 with (4) 5/8" lockwasher PN 1151.
17. Insert dumbell roller shafts with nylock nut through bottom tong plate, through dumbell roller assemblies, and finally through top tong plate. After installing dumbell roller shafts through top tong plate fasten with 1"-12 nylock nut PN 1213.

ASSEMBLY INSTRUCTIONS

18. High Gear Idler Assembly:
    a) Press (2) bearing PN 1909 into high gear idler PN 55123.
    b) Install snap ring PN 1950 into high gear idler PN 55123.
    c) Install high gear idler assembly onto high gear idler shaft PN 55124.
    d) Install internal snap ring PN 1949 onto high gear idler shaft PN 55124.
19. Press bearing PN 1901 into bearing retainer PN 55063-S4, then install internal snap ring PN 1948 into groove of bearing retainer PN 55063-S4.
20. Install high gear PN 55119 on pinion gear PN 55038-01.
21. Install high gear retainer PN 55122 on pinion gear PN 55038-01.
22. Install Snap Ring PN 1950 on pinion gear PN 55038-01.
23. Install low gear housing cover PN 10011 with (8) 3/8"-16 x 4 1/2" HHCS PN 1075 and 3/8" lockwasher PN 1027.
24. Secondary Bearing Cap Assembly:
    a) Press bearing PN 1901 into top secondary bearing cap PN 55143 (replaces PN 55080).
    b) Install (4) 3/8"-16 x 1/2" set screw PN 1029 into top secondary bearing cap (use removable Loctite).
    c) Install 1" NPT flush plug PN 1611 into top secondary bearing cap.
    d) Install top secondary bearing cap assembly onto secondary input gear PN 55048 with (3) 1/2"-13 x 1" HHCS PN 1110 and (3) 1/2" lockwasher PN 1103.
25. Shifting Gear/Detent Assembly:

    Install (2) spring plunger PN 1311 in shifting gear PN 55084-02.
26. Install motor PN 45078 with motor shaft PN 55086-A, polypack seal PN 12501437, seal retainer PN 55088, and motor spacer PN 55085 in motor box housing with (4) 1/2"-13 x 1 1/4" HHCS PN 1111 and (4) 1/2" lockwasher PN 1103.
27. Install shifting gear PN 55084-02 and motor shaft bearing spacer PN 55121-01 with shifting shaft PN 10085,shifting yoke PN 45061, washer PN 45068, and 3/16" x 1" roll pin PN 1006 in motor box.
28. Remote Shift Cylinder Assembly:
    a) Install (2) 3/16" Drive Zert PN 1004 onto Spring Housing PN 2079.
    b) Install Spring Housing PN 2079 on Rear End Cap PN 2082.
    c) Install (24) Belville Springs PN BUCS4024, Piston Rod PN 2080, and (42) Belville Springs PN BUCS4024 into Spring Housing Assembly.
    d) Install 1/2" Rod Wiper PN 959-1 in Front End Cap PN 2081 and install onto Spring Housing Assembly.
    e) Clamp Rod Boot PN 14018 onto Auto Shift Cylinder PN 2047. Install the other end of Rod Boot into Rear End Cap PN 2082 using removable Loctite. Clamp Rod Boot onto Rear End Cap.
    f) Install Rod Clevis PN 1099 onto Piston Rod PN 2080 using removable Loctite.

ASSEMBLY INSTRUCTIONS

g) Install Rear Mounting Bracket PN 10053 onto Top Tong Plate Assembly using (2) 5/8"-11 x 2 1/4" HHCS PN 201 with (2) 5/8" Lockwashers PN 1151.

h) Install Auto Shift Cylinder PN 2047 onto Rear Mounting Bracket PN 10053 using a Clevis Pin PN 10041 and 1/8" x 1" S/S Cotter Pin PN 1252B.

i) Install Shifter Shaft Assembly PN 10085 onto Rod Clevis PN 1099 using a Clevis Pin PN 10041 and 1/8" x 1" S/S Cotter Pin PN 1252B.

29. Install (20) 1 1/2" Cam Follower PN 1968 in Top Tong Plate using (20) 5/8" Hi Collar Lockwasher PN 1152 with (20) 5/8"-18 Hex Nut PN 271.

30. Install (20) 1 1/2" Cam Follower PN 1968 in Bottom Tong Plate using (20) 5/8" Hi Collar Lockwasher PN 1152 with (20) 5/8"-18 Hex Nut PN 271.

31. Cage Plate Assemblies:

    a) Install brake drum on top cage plate using (12) 1/2"-13 x 1 1/2" HHCS PN 1112 and (12) 1/2" Lockwasher PN 1103.

    b) Install brake drum on bottom cage plate using (12) 1/2"-13 x 1 1/2" HHCS PN 1112 and (12) 1/2" Lockwasher PN 1103.

    c) Place Bottom Cage Plate PN 10004-01 on Tong Body.

    d) Place Top Cage Plate PN 10003-02 on Tong Body.

    e) Align (4) Cage Plate Spacers PN 10023-01 with holes on Cage Plate and fasten with (4) 1/2"-13 x 9 1/2" HHCS PN 1117-A, (4) 1/2" Lockwashers PN 1103, and (4) 1/2"-13 Nuts PN 1101.

32. Remote Pivot Pin Assembly:

    a) Install Locking Pin Base Plate Weldment PN 2058 onto Top Cage Plate PN 10003-02 with (8) 3/8"-16 x 1" SHCS PN 1041 using removable Loctite.

    b) Install (2) Locking Pin PN 10050 into Locking Pin Base Plate Weldment PN 2058, then through Top Cage Plate PN 10003-02.

    c) Install (2) Locking Pin Cross Bar PN 71073 onto Locking Pin Assembly using (2) 3/8"-16 x 2 1/4" HHCS PN 1055 with (2) 3/8"-16 Nylock Nut PN 213 in outer holes and (1) 1/2"-13 x 2 1/4" HHCS PN 173 with (1) 1/2"-13 Nylock Nut PN 1087 in center hole.

33. Pivot Pin Cylinder Assembly:

    a) Install Reversing Pin Bracket Assembly PN 10051 onto Top Tong Plate Assembly using (2) 1"-12 LP Nylock Nut PN 1213 from Rear Dumbell Assemblies.

    b) Install (2) Reversing Pin Cylinders PN 13606 onto Reversing Pin Bracket Assembly PN 10051 using (8) 1/4"-20 x 1" HHCS PN 105 with (8) 1/4" Lockwashers PN 101 and (8) 1/4"-20 Nut PN 100.

34. Door Assembly and Door Installation

    a) Press Garlock Bushing PN 2021 in top and bottom of Tong Door Assembly PN 10012-01.

    b) Install 1/8 NPT Zert PN 1001 in Door Shaft PN 2061.

    c) Install 1"-12 Nylock Nut PN 1213 on Door Shaft PN 2061.

d) Mount Tong Door on Tong.

e) Install Thrust Spacer PN 2025 between the Top Door Plate and Tong Body.

f) Slide Inner Race PN 1954-A and Door Bushing PN 2040 onto Door Shaft Assembly.

g) Install Tong Door Shaft Assembly through Bottom Door Plate, Bottom Tong Plate, Dumbell Roller Assembly, Top Tong Plate, Top Thrust Spacer, Top Door Plate, and Top Door Spacer Bushing.

h) Slide additional Inner Race PN 1954-A and Door Bushing PN 2040 onto Door Shaft Assembly.

i) Install 1"-12 Nylock Nut PN 1213 onto Tong Door Shaft Assembly.

j) Install Door Sleeve Target PN CRSS10034 onto top of Door.

k) Install (2) 3/8"-16 x 1/2" Set Screws PN 1029 (use removable Loctite) on Door Sleeve Target.

35. Hydraulically Activated Brake System Assembly: (2 Units Required)

a) Install (2) 1/8" NPT Zert PN 1001 in Brake Arm Dumbell Shaft PN 10048 as shown in Brake Arm assembly drawing.

b) Press a 1 1/8" x 3/4" Garlock Bushing PN 14053 in center hole and a 1/2" x 3/4" Garlock Bushing PN 14054 in the edge hole in Brake Arm as shown in assy. drawing.

c) Install Brake Arm Dumbell Shaft PN 10048 onto Brake Arm PN 10021-01, using an Aluminum Washer PN 41037 and a 3/16" x 1 1/2" S/S Cotter Pin PN 1252, in hole location shown in Brake Arm assembly drawing.

Note: Assemble as right and left assembly.

d) Install Cylinder Mounting Shaft PN 10019-01 in hole location of Brake Cylinder Base Plate PN 10020, using an Aluminum Washer PN 41037 and a 3/16" x 1 1/2" S/S Cotter Pin PN 1252, as shown in Brake Cylinder assembly drawing.

e) Install Brake Cylinder PN 2019 onto Brake Cylinder Base Plate Assembly using (4) 3/8"-16 x 1" SHCS PN 1041 with (4) 3/8" Hi Collar Lockwasher PN 1026.

f) Attach Rod Clevis PN 2008 to Brake Cylinder Assembly with a Clevis Pin PN 10041 and 1/8" x 1" S/S Cotter Pin PN 1252B.

36. Brake Control Valve Description and Setting Instructions:

See Section 8, Pages 2 and 3.

SUSPENSION SYSTEM SPRING INSTRUCTIONS

SPRING REMOVAL PROCEDURE

1. Attach lifting slings to tong. Raise the tong using the crane until the cable stops contact the bottom of the spring housing's rectangular tubing.
2. Using the spring adjustment tools provided, rotate the nut on the spring adjustment rod counter clockwise while holding the spring adjustment rod to prevent turning.
3. Remove spring adjustment assembly's clevis pins from the tong's lifting eye.
4. Rotate spring adjustment assembly's open socket and cable stop until they are parallel with the spring housing's centerline. Pull spring adjustment assembly from front (tong door) end of spring housing.
5. Remove spring plunger and spring(s) from rear end of spring housing.

SPRING INSTALLATION PROCEDURE

1. Install springs in spring housings from open end.
2. Lubricate entire length of threads on spring adjustment rod using Never-Sez or equivalent.
3. Install spring adjustment assembly through center of spring from closed end until the cable stop contacts the spring stop plate within the spring housing. *Note:* Removing the sheave and shaft will allow more room for access.
4. From open end of housing install spring plunger over end of spring adjustment rod. Push spring plunger over spring adjustment rod until it contacts the spring(s). Use care to insure spring fits over step on the OD of the plunger.
5. Install 1" washer over spring adjustment rod and push until it contacts the spring plunger.
6. Install 1"-8 NC Hex Nut (grade 8) on end of spring adjustment rod. Make up nut on rod until the hex shaped end of the spring adjustment rod is fully exposed.
7. From closed end of spring housing, pull on spring adjustment assembly's open socket until all slack is removed. Reinstall sheave and shaft if not present.
8. Rotate open socket and cable stop downward insuring cable passes over sheave correctly.
9. Install the tong in frame using a crane or fork lift. Raise the tong until all open sockets can be pinned to tong lifting eyes.
10. Lower the tong until the upper surface of the cable stop is approximately 4 inches below the bottom of the spring housing.
11. Begin tightening nuts on spring adjustment assemblies until the system begins to transfer the weight of the tong from the crane to the suspension assembly. *Note:* We suggest that this be done in a fashion where no single cable is allowed to pick up a significant amount of weight until the slack is removed from the other cables.
12. Slack off weight suspended by fork lift or crane to transfer tong's weight to the suspension system.
13. Complete tightening and adjusting until tong is level from front to rear and left to right while allowing a minimum of 4 inches of upward travel. Confirm that a minimum of 4 inches of downward travel is also available. The tong should move freely and return to the neutral position whenever the loads are released.

OPERATIONAL INSTRUCTIONS

1. Position suspension system on rig floor so it can be installed in Varco Casing Roughneck.
2. Remove caps from hydraulic quick disconnects (supplied by Varco). Clean quick disconnects with solvent and compressed air.
3. Remove latch pin from anchor clevis (supplied by Varco).
4. Position Varco Casing Roughneck so that its lifting bars can engage the suspension system hooks. Engage the latch pins.
5. Shut off hydraulic power unit and bleed pressure.
6. Attach hydraulic hoses and electronic cables to quick disconnects on suspension system.
7. Remove shipping stiffing bar from upper portion of suspension system.
8. Convert unit from shipping to operating by loosening shipping turnbuckles until shackles and chains can be removed.
9. Verify tong is suspended by cables and compression spring system. The tong should be able to move up and down approximately 4 inches.
10. Install appropriate tong jaws, die adapters, and dies as required.
    A) Be sure all power to unit is off, and power unit is shut down. Isolate hydraulic power supply.
    B) Determine O.D. of tubular to be made-up or broken-out. Use proper dies to bite O.D. of tubular and insert as follows: Remove jaw assembly from tong. Remove spring retainer post and upper die retainer clips. Insert rear die into jaw. Reinstall clips and spring retainer posts, attach springs.
        1. Disconnect springs and remove rear jaw.
        2. Disconnect front jaw springs and swing one front jaw into throat of tong. Remove clip retainer bolts and clip. Insert die into front jaw. Reinstall clip and retainer bolts, swing jaw back into pocket and reattach spring. Repeat for opposite side.
11. Tong should be level when dressed with jaws. Utilize **CLINCHER®** adjustment tools to adjust as required.
12. Install appropriate backup die adapters and dies as required.
    Caution: Do not attempt to bit on over/under sized pipe.
13. Install appropriate upper and lower guide plates and pin in place.
14. Start power unit, test functions of tong and backup, check for leaks, follow Varco procedure. Pick up and hang off joint of tubing or casing leaving enough space between top of slip assembly and bottom of coupling. Start of upset to accommodate the elevators or bottom guide plate and backup dies.
    A. Insure proper dies are installed.
    B. Check to make sure all hose connections are secure and hydraulic system is free of leaks.

OPERATIONAL INSTRUCTIONS

C. Be certain door is completely closed before operation to insure safe operation. The **CLINCHER®** Tong is equipped with a door switch, which prevents operation of the tong when door is even partially open.

D. Use power unit to start up procedure as outlined in your owners manual supplied by the manufacturer.

E. In the event hose Quick Disconnects are not tightened securely, possible failures to hydraulic system can occur.

1. If pressure supply hoses are restricted or flow is blocked, pressure will increase in the hydraulic power unit, resulting in increased RPM in diesel power unit or high current draw with electric power unit.

2. If return line hoses are restricted or flow is blocked, pressure will increase in the hydraulic power unit and the hydraulic system to the tong itself, resulting in the tong motor increasing to maximum pressure and possible motor seal failure.

F. After completion of A through E restart the power unit and allow oil to circulate for approximately 10 minutes. Place shifting lever into low and rotate several times. Repeat in reverse. If correct jaw-die combination is installed, the unit is now ready to run pipe.

15. Verify cage plate and ring gear are in open throat position or open tong door and backup. Move laterally and vertically using Varco Casing Roughneck until lower guide plate contacts tubular extending above slip assembly.
Caution: Slow movement before contacting pipe.

Refer to Varco Control Instructions.

16. Close backup on pipe. Note: Pressure should rise to 2500 psi when backup is fully set.

17. Pick up joint to be made up using Varco pipe handler. Swing in until joint contacts upper guide plate. **Caution:** Insure male threads are low enough to avoid contact with upper guide plate but high enough to avoid contact with upper guide of coupling. Do not swing in at rapid rate to avoid unnecessary shock loads.

18. Slowly slack off until male thread enters female thread.

19. Verify backup pressure is at 2500 psi by momentarily actuating backup control to closed position.

20. Close tong door by actuating door control.

21. Shift tong into high or low gear as required by using gear control.

22. Select tong operation mode (make-up or break-out) as required.

23. Select reversing pin direction required for operation mode (make-up or break-out).

24. Back out (by rotating counter-clockwise) panel mounted torque limiter until it stops.

25. Slowly move panel mounted tong directional control joystick to initiate ring gear rotation as required. Jaws will rotate inward until they grip OD of tubular. Rotation will begin and continue until pressure required to rotate matches setting of torque limiter.

OPERATIONAL INSTRUCTIONS

26. Continue to hold tong directional control joystick in fully displaced position while slowly increasing torque by rotating panel mounted torque limiter inward (clockwise) until desired torque is read on torque gage.

    Note: In critical torque applications the torque gage should not be used to measure and control applied torque. A torque turn data acquisition and control system with automatic dump feature must be used for precise control to avoid leaks or damaged connections.

    Note: It may be necessary to shift from high to low gear during some make-up operations to achieve required torque.

27. After achieving desired make-up torque, slowly release applied torque and open jaws by rotating in "Reverse" direction. Tong will rise up distance equivalent to thread make-up when jaws release from pipe.

28. Continue slow reverse rotation until cage plates and ring gear automatically stop at open throat position.

29. Open tong door by actuating door open control.
    Note: Door will remain open until closed.

30. Open backup by actuating backup open control.
    Note: Backup will remain open until closed.

31. Move suspension system, tong, backup, and casing roughneck away from tubulars using roughneck controls.

32. Run tubulars to point when next joint is required. Repeat steps 15 thru 30 as required.

33. To break-out a joint:

    a) Insure ring gear and cage plate are in open throat position.

    b) Shift tong mode operation to break-out position.
       Note: Mode is detented and will remain in this position until shifted.

    c) Shift reversing pin to break-out position by momentarily actuating control.
       Note: Control will return to neutral position when released causing cylinder to retract.

    d) Slowly shift panel mounted tong directional control joystick in break-out direction to cause jaws to grip pipe and torque developed to back out joint.

    e) After joint is fully backed out, the jaws may be opened by slowly rotating the ring gear in the forward make-up direction. Note: Tong may move down when jaws release. Continue forward rotation until cage plates stop in open throat position.

MAINTENANCE INSTRUCTIONS

CLINCHER® recommends that owners of **CLINCHER®** Hydraulic Power Tongs, Backups, **CHROMEMASTER™**s and accessories adapt a regularly scheduled maintenance program. Implementation of this type of program offers several benefits. First you increase the life of your equipment, secondly, you may find a problem before it escalates to a costly repair or down time on the job, and most importantly, prevent injury to operating personnel.

A major inspection (described at the end of this section) should be carried out if equipment is suspected to have been damaged during transit or is to be mobilized to a remote location where maintenance operations are difficult to carry out.

Routine Maintenance

Cleaning - Upon return from each and every job:

A) Pre-wash unit to remove majority of dirt and grease build up as to allow removal of dies, and inspection of overall condition of unit.

B) Remove and inspect dies from tong and backup. Note any missing or damaged die retainers, and or die retainer bolts.

C) Remove side jaws from tong and inspect side jaw for missing or broken parts, damaged splines, broken ears (locking hooks on front portion of side jaws.)

D) Clean and inspect side jaws, jaw pins, jaw rollers for damage or excessive wear (cracks, breakage, and uneven wear patterns). Reassemble jaw sections replacing any damaged parts. Lubricate pins and rollers, and reinstall in tong.

E) Clean and inspect backup operating cylinders. Insure sline area is free from damage and any rust or dirt is removed. Replace any missing or damaged die retainer clips and die retainer bolts.

F) Inspect all hoses for wear, replace as necessary.

G) Inspect hanger assembly to assure all parts are returned and in operating condition. (*i.e.* H-Plates, spring, leg springs, leg spring caps and pins.)

H) Replace jaw, pins and rollers in tong.

I) Lubricate tong's cam followers (upper and lower), dumbell roller shafts (upper and lower zerts), door shaft, idler gear shaft, outboard idler gear shafts (3), pinion gear, and secondary gear assemblies (Pinion gear and secondary gear assemblies are installed with sealed bearings. There is no provisions to grease these bearings. However, if replaced by non-sealed bearings, the 1/8" N.P.T. flush plugs should be replaced with zerts PN 1001 and both gear assemblies should be added to the regular lubrication schedule.), low gear housing, and shift housing (2 zerts each), and re-pack tong body cavity. Lubricate zerts in backup plates and pins.

MAINTENANCE INSTRUCTIONS

J) Install dies of a size needed for testing purposes, and attach hydraulic power unit to tong. Before energizing power unit make certain no one is working on tong or backup and all tools and parts are removed from the tong and backup.

K) Insert test mandrel of the exact same size as the dies which are installed in the tong and backup. **Caution:** Testing the function of the backup without the proper size dies installed and/or without the proper sized mandrel in place, you risk serious damage to the backup cylinder.

L) After power unit has reached operating R.P.M. and temperature, operate the backup control valve and close backup around test mandrel using sufficient flow and pressure to clamp mandrel and maintain pressure to backup. (Recommended operating pressure of 2,500 psi) Backup pressure gauge should match system operating pressure. After release of control valve you may experience a slight drop in backup pressure (up to 300 psi) this is normal. If backup pressure drops more than 300 psi within 2 minutes, you may be experiencing a hydraulic leak.

M) While maintaining pressure on backup visually inspect hoses, stainless steel lines, fittings, etc., for seepage of hydraulic fluid. Repair or replace parts causing leaks. If you see no visible external leaks and your backup is still losing pressure, there may be an internal leak in the operating cylinder or load holding valve allowing fluid to bypass the piston. It is recommended that the backup be returned to the manufacturer for repair.

N) If at this time your backup is functioning correctly, open and close unit several times to insure consistent operation.

O) With the proper dies installed in the tong and backup, and test mandrel locked in the backup, place reversing pin into the make-up position, set tong into low gear and operate tong through several cycles of locking, biting and torquing to required torque. Change reversing pin to break-out position and repeat. Repeat same procedure in high gear.
Note: Torque developed in high gear is considerably less than torque developed in low gear.

P) Test door interlock system by opening door slightly with tong rotating. (Remove test mandrel for this procedure.) The tongs rotation should stop. If tong rotation fails to stop, close door, cease rotation, deactivate power unit, and inspect door interlock switch for damage. Insure that adjustment collar is oriented to allow wheel of door switch to fit into recess on collar.
Warning: If door switch system is not functioning properly tong must not be used.

Q) Re-inspect tong and backup hydraulic system for leaks.

R) If at this time the unit is functioning as intended, replace all covers and grease splines in tong and backup (side jaws and back jaws), tape or grease spools on control valves (to prevent paint from adhering to polished spool surface), prime and paint unit for storage.

MAINTENANCE INSTRUCTIONS

Recommended Lubrication Schedule Performed After Completion Of Each Job

Hydraulic Tong

a) Cam followers: upper and lower (all)
b) Dumbell roller shafts: upper and lower (all)
c) Door shaft
d) Idler shaft
e) Outboard Idler shafts (3)
f) Low gear housing (2 zerts)
g) Shift housing (2 zerts)
h) Re-pack tong cavity
i) Pinion and secondary gear shafts (if sealed bearings have been replaced by non-sealed bearings)
j) Jaw rollers and pins: Remove jaw pins and rollers, clean and lubricate with gear grease
k) Inspect hydraulic fluid for foreign material and contaminant. Filter or replace. You must filter or replace entire system including power unit tank and lines along with tong to insure all contaminants are removed.

Annual Major Maintenance

Inspection and repair

Routine preventative maintenance will significantly extend the operating life of your equipment, reduce operating cost and avoid downtime. **CLINCHER®** recommends a program of frequent routine inspection, and if equipment is suspected to have been damaged during transit or is to be mobilized to a remote location where maintenance operations are difficult to carry out, perform the following:

A) Visually inspect components on power tong or backup which could possibly have been damaged either during operation or transit. *i.e.* Damage to hanger assembly, hydraulic backup, mounting legs, or hydraulic valve assembly.

B) Check test date. Ensure that a load test and inspection was carried out within the last 9 months.

C) Check ring gear. Check for any signs of damage or wear.

D) Remove motor and valve assembly from the tong body.

E) Check motor seal. Apply hydraulic power, run motor and visually check motor seal for any signs of leakage.

F) Check drive gear, high and low pinion gears. Check for excessive sign of wear on motor gear.

MAINTENANCE INSTRUCTIONS

G) Check condition of control valve spools. Activate valves and check for any sign of wear, pitting, or scoring of the chrome surface of spools. If spool is damaged in any way, the complete section must be changed out. Spools are not interchangeable.

H) Check gear selector and shaft. Visually inspect the shifting shaft for alignment and straightness.

I) Check Hi/Low Gear assembly. Visually inspect high and low clutch and gears for any sign of chipped, broken, or worn teeth.

J) Check dumbell rollers, shafts and bushings. Check for excess movement on either bearings, bushings, shafts or dumbells.

K) Check idler gears and center pinion shaft gears and bearings. Check that there are no signs of worn, chipped, or broken teeth on idler and center pinion shaft gears.

L) Check door bearings. Visually check excess movement on bearings at door assembly. If excess movement is found door must be removed making careful note of bearing washers positions for reassembly.

M) Check door switch system. Visually check that door switch valve has sufficient strength to hold door in closed position. If this is not the case, then repairs are required.

N) Check door safety device. Functionally check tong door safety switch. Engage low gear, open tong door and push rotor control lever forward as if to rotate rotor. If safety device is operational then the rotor will not rotate.

O) Check lifting hanger test date. Check lifting hanger for damage. Ensure that a load test and inspection was carried out within the last 9 months.

P) Check condition of all hydraulic hoses and fittings. Visually inspect all hydraulic hoses fitted to the tong and in the backup for any signs of leaks, cuts, or wear.

Q) Reinstall all parts which were removed for inspection and/or damage. Connect to hydraulic power supply and function test operation of tong in high, low, forward, and reverse. Torque test utilizing appropriate dies and test mandrel. Test operation of lift cylinder.

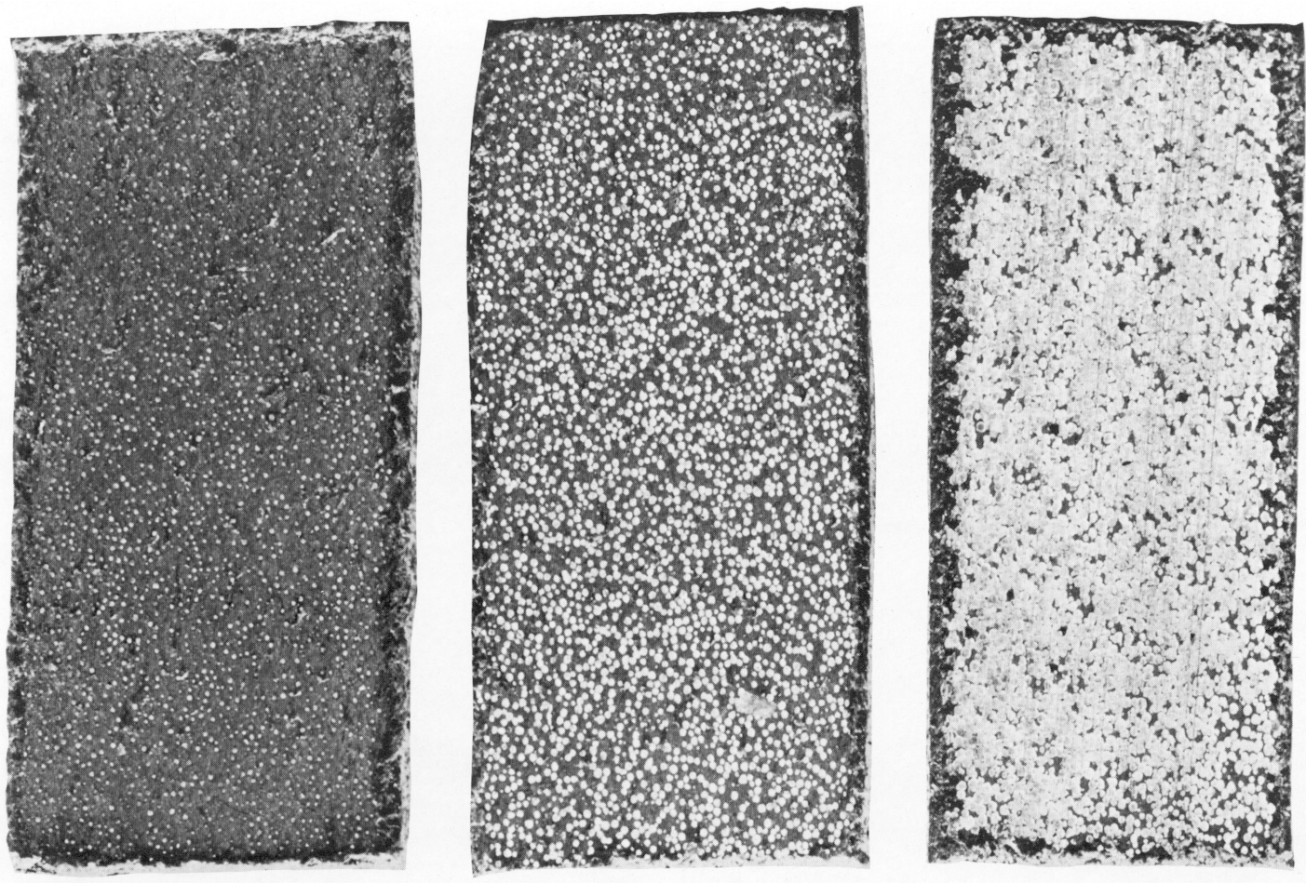
R) Inspect power unit system according to manufactures specifications.

S) Lubricate tong and backup according to maintenance schedule preceding this section.

T) Paint, remembering to mask off surfaces not intending to paint with grease or masking tape.

U) Complete dated inspection report giving details of all duties performed along with complete list of items replaced.

DU® BEARING DRY WEAR PROCESS



1. 2. 3.

1. Running-in completed. Low wear rate starts when up to 10% of the bronze is exposed.

2. Typical surface appearance when DU® bearing approaches its half life with 40% to 50% of the bronze exposed.

3. Bronze is beginning to smear near the end of DU's useful life as a dry bearing. Over 75% of the bronze is visible at the surface.

For additional information about DU bearings, please contact Garlock Bearings Inc,
700 Mid Atlantic Parkway, Thorofare, New Jersey 08086. **(609) 848-3200** FAX: (609) 848-5115

TROUBLESHOOTING

HYDRAULIC SYSTEM

Hydraulic Pump Making Excessive Noise:

	Problem	Solution
A)	Restricted or clogged intake line	Clean line, check for contamination.
B)	Contaminated fluid	Flush system, change fluid.
C)	Restricted vent	Clean or replace air vent.
D)	Air in fluid	Check for leaks and be certain fluid suction in tank is well below hydraulic fluid in reservoir.
E)	Damaged or worn parts	Repair or replace damaged parts, check fluid for contamination.
F)	Excessive RPM	Check PTO, gears, and recommended speed to assure proper pump is installed for operation.
G)	Increased friction	Make sure pump has been assembled using correct torque valves.
H)	Damaged or worn relief valve.	Replace relief valve.
I)	Damaged or worn check valve.	Replace check valve.
J)	Restricted discharge	Check to make sure relief valve is set to proper pressure.
K)	Valve system restricted	Inspect and repair or replace defective parts, check system for contamination.

Excessive Wear to Hydraulic Components:

	Problem	Solution
A)	Fluid contamination	Flush fluid system, replace with new fluid.
B)	Components misaligned	Inspect and realign.
C)	High operating pressures	Gauge and set to proper pressure.
D)	Exhausted fluid (depletion of additives)	Flush fluid system, replace with new fluid.
E)	Air in fluid	Check for leaks, and be certain fluid suction in tank is well below hydraulic fluid in reservoir.
F)	Shortened bearing life	Check alignment, insure proper lubrication to non-sealed bearings.

TROUBLESHOOTING

HYDRAULIC TONG SYSTEM

Slow Tong Speed:

	Problem	Solution
A)	Restricted supply line	Clear supply line and check intake on reservoir.
B)	Low fluid level	Add fluid to proper volume.
C)	Air leak	Locate and repair leak.
D)	Pump speed insufficient	Assure proper pump speed for application.
E)	Damaged or worn equipment	Isolate pump and check pressure to determine whether motor or pump is defective. Repair or replace defective part.
F)	Pump not primed	Check fluid viscosity and restrictions of intake line. Replace fluid if inadequate for operating temperature.
G)	Low or no flow from supply line	Check to assure couplings are securely fastened.
H)	Hydraulic bypass valve malfunction	Inspect. Adjust unloading pressure. Replace or repair as necessary.

Insufficient Torque:

	Problem	Solution
A)	Door switch malfunctioning	Check to make sure door is completely closed. Inspect door switch and dump valve. Replace or repair door switch and/or dump valve.
B)	Relief valve malfunctioning	Relief set too low, broken valve spring, contamination or defective seals.
C)	Damaged or worn pump parts	Inspect, repair, or replace.
D)	Slow pump speed	Assure proper pump speed for application.
E)	Improper system fluid	Check fluid viscosity and replace fluid if inadequate for operating temperature.
F)	Directional control valve set improperly	Check relief and directional control valve. Neutral should return slightly to reservoir.

TROUBLESHOOTING

HYDRAULIC TONG SYSTEM

Insufficient Torque:

	Problem	Solution
G)	Damage tong motor	Inspect, repair, or replace.
H)	Restriction of supply line, excessive back pressure	Check to assure couplings are securely fastened.
I)	Defective gauge or load cell	Inspect, repair, or replace. Assure unit has been calibrated to proper arm length. NOTE: When using **CLINCHER®** integral backup system, it is the length of backup arm, NOT the tong arm length.

Difficulty Shifting Gears:

	Problem	Solution
A)	Broken key in shifting yoke	Inspect and replace key stock in shifting yoke.
B)	Worn or damaged shifting yoke pins	Inspect and replace broken or worn pins.
C)	Insufficient lubrication	Pump grease into both zerts located on shift housing.
D)	Detent ball bearing spring set too tight	Inspect and relieve pressure by adjusting set screw on shifting gear PN 55084.

Failure to Grip Tubulars:

	Problem	Solution
A)	Jaws move out from neutral, but fail to penetrate pipe. Tong not perpendicular.	Inspect die size and replace with correct dies for pipe. Wrong size dies for tubulars. Assure suspension of tong is perpendicular to tubulars. Adjust hanger as necessary.
B)	Jaws fail to move out of neutral. Brake band not tight enough, faulty cam followers, rust debris or damage to jaws.	Inspect for excessive wear on brake band. Inspect and replace defective cam followers. Remove rust and debris from jaws, and jaw pockets. Inspect jaw rollers and pins for wear, flats, and lubrication. Repair, replace, and lubricate as needed.

TROUBLESHOOTING

HYDRAULIC TONG SYSTEM

Failure to Grip Tubulars:

	Problem	Solution
C)	Tong will not release from tubular. Brake band not tight enough, defective cam followers in cage plate, insufficient lubrication to jaw pin and roller.	Inspect for excessive wear on brake band. Inspect and replace defective cam followers. Remove rust and debris from jaws, and jaw pockets. Inspect jaw rollers and pins for wear, flats, and lubrication. Repair, replace, and lubricate as needed.
D)	Tong motor runs but ring gear does not rotate. Broken gears or defective shift in hydraulic tongs system.	Inspect and replace defective gears. Inspect and repair or replace defective shifting parts.
E)	Tong binds under light load. Worn or damaged cam followers, dumbell roller bearing, or idler bearing.	Inspect and replace defective parts.
F)	Ring gear rotates while control lever is in neutral.	Replace control valve.
G)	Shift will not stay in set position. Lost detent ball or spring.	Replace detent ball and spring.
H)	Hydraulic fluid leaking from motor. Damaged or worn motor shaft seal.	Replace motor shaft seal.

HYDRAULIC BACKUP SYSTEM

Failure to hold tubulars:

	Problem	Solution
A)	Incorrect die for size tubular	Check pipe OD and match die size to pipe OD.
B)	Dies have material compacted in tooth area; worn teeth.	Clean dies with wire brush and inspect. Replace with new dies if necessary.
C)	Power unit pressure set incorrectly	Inspect relief valve on power unit to make sure enough system pressure is being delivered to backup.
D)	Counter balance valve not holding pressure	Remove side plates on backup. Bench test and replace the defective counter balance valve.
E)	Internal leakage in backup cylinder	Disconnect lines and bench test cylinder. Repair or replace as necessary.
F)	Jaws will not retract. Counter balance valve is stuck.	Replace counter balance valve.
G)	External leakage of cylinder	Repair or replace cylinder.
H)	Control valve set to neutral, but jaws extend.	Inspect control valve for damage and/or incorrect spool. Repair or replace as necessary.

SECTION 7 PARTS LISTS

RECOMMENDED TONG SPARE PARTS LIST

Part Number	***Quantity***	***Description***
12501437	1	Seal for Rineer Motor
10031 or 10131	2	Standard Jaw Pins or S/S Jaw Pins
10031LF or 10131LF	2	Low Friction Jaw Pins or S/S Low Friction Jaw Pins
10014	2	Standard Jaw Rollers
10014LF	2	Low Friction Jaw Rollers
1001	8	1/8 NPT Zerts
45061	1	Shifting Yoke
10024	1	Brake Band Assy.
1968	4	Cam Followers
10027	4	Tong Die Clip
1008-C	8	SHCS 1/4"-20 x 1/2"
10040 or 10016	4	Jaw Retainer Spring or Heavy Duty Jaw Spring
CLEBU1121	2	Backup Retainer Clips

SECTION 7 PARTS LISTS

CLINCHER® TONG PARTS LISTS

CLE1075-02 / 10 3/4" REMOTE CASING TONG ..... 7 - 5
10010 / MID BODY FOR 10 3/4" TONG ..... 7 - 14
10012-01 / TONG DOOR ASSEMBLY ..... 7 - 15
10024A / BRAKE BAND ASSEMBLY – NEW STYLE ..... 7 - 15
10059L / LEFT LOAD CELL BRACKET ..... 7 - 16
10059R / RIGHT LOAD CELL BRACKET ..... 7 - 16
10080 / BOTTOM TONG PLATE WELDMENT ..... 7 - 17
10081 / TOP TONG PLATE WELDMENT ..... 7 - 17
OR1000 / ENCODER ADAPTER ASSEMBLY ..... 7 - 18
CJ-10A / 10 3/4" JAW SET ASSEMBLY W/ SS PIN ..... 7 - 19
CJ-10B / 10 3/4" JAW SET ASSEMBLY ..... 7 - 19
CJ-LF-10A / 10 3/4" LF JAW SET ASSEMBLY W/ SS PIN ..... 7 - 20
CJ-LF-10B / 10 3/4" LF JAW SET ASSEMBLY ..... 7 - 20
CJDT10-1025R / 10 1/4" DOVETAIL JAW SET ASSEMLBY ..... 7 - 21
CJDT10-9875R / 9 7/8" DOVETAIL JAW SET ASSEMBLY ..... 7 - 22
CJDT10-9875 / 9 7/8" DOVETAIL JAW SET ASSEMBLY W/ SS PIN ..... 7 - 22

LOCKJAW™ BACKUP PARTS LISTS

BUCS1175-01 / 11 3/4" **LOCKJAW™** BACKUP ..... 7 - 23
BUCS11001 / TOP PLATE WELDMENT ..... 7 - 26
BUCS11020 / BOTTOM PLATE WELDMENT ..... 7 - 26
BUCS1176 / INSIDE DOOR ASSEMBLY ..... 7 - 27
BUCS1177 / OUTSIDE DOOR ASSEMBLY ..... 7 - 28
SHC1175 / CYLINDER ASSEMBLY ..... 7 - 29
SHC1102 / CYLINDER BARREL WELDMENT ..... 7 - 29
ASAP1175 / SEAL KIT F/BUCS1175 & BUCS21 ..... 7 - 30

SUSPENSION SYSTEM PARTS LISTS

CRSS10750 / 10 3/4" SUSPENSION SYSTEM ..... 7 - 31
CRSS10750-01 / 10.75/11.75 VARCO SYSTEM ELECTRONIC SENSOR CK ..... 7 - 33

SUPERIOR MANUFACTURING

Pick List

CLE1075-02 / 10 3/4" REMOTE CASING TONG

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
00CLE107502	PICKLIST F/CLE1075-02 ELECTRONIC REMOTE TONG REV DATE: 04/23/03	each		1	_____
100	NUT 1/4"-20 GR.8	each	55	8	_____
10003-02	TOP CAGE PLATE F/10 3/4" REMOTELY OPERATED TONG	each		1	_____
10004-01	BTM. CAGE PLATE F/CLE1075-01	each		1	_____
10009-01	RING GEAR F/10 3/4" TONG	each		1	_____
1001	ZERT 1/8" NPT	each	50	32	_____
10010	MID BODY F/10 3/4" TONG (PICK LIST)	each		1	_____
10011	LOW GEAR HOUSING COVER	each		1	_____
10012-01	TONG DOOR ASSY. F/CLE1075-02 REMOTE TONG	each		1	_____
10017-03	BRAKE HUB FOR 10 3/4 TONG NEW STYLE	each		1	_____
1002	ZERT 90 DEG. 1/8" NPT	each	50	2	_____
10020	BRAKE CYLINDER BASE PLATE	each		2	_____
10021-01	BRAKE ARM F/10 3/4" TONG	each	M1-A	2	_____
10022	TOP BEARING RETAINER	each	M1-A	1	_____
10023-01	CAGE PLATE SPACER	each		4	_____
10024A	BRAKE BAND ASSEMBLY-NEW STYLE 10 3/4" TONG PICK LIST	each		1	_____
10035-01	JAW SPRING RETAINER POST F/10 3/4" TONG	each	M1-B	2	_____
10038-01	BRAKE REAR CLEVIS PIN	each		1	_____
1004	DRIVE ZERT 3/16"	each	50	14	_____
10041	CLEVIS PIN-CLP-172S	each	M1-B	5	_____
10043	COTTER PIN 5/32" X 1 1/2" SS	each	M1-B	6	_____
10044	CYLINDER PLATE SPACER	each	M1-B	2	_____

SUPERIOR MANUFACTURING

Pick List

CLE1075-02 / 10 3/4" REMOTE CASING TONG

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
10048	BRAKE ARM SHAFT W/NITRIDE-FINSH F/CLE1075-02	each		2	_____
10049	PIVOT PIN W/ NITRIDE FINISH F/CLE1075-02	each		2	_____
10050	LOCKING PIN W/ NITRIDE FINSH F/CLE1075-02	each		2	_____
10051	REV. PIN BRACKET ASSY. F/CLE1075-02 REMOTE TONG	each		1	_____
10053	AUTOSHIFT REAR MTNG. BRKT. F/CLE1075-02 REMOTE TONG	each		1	_____
10057	REAR DUMBELL SHAFT F/CLE1075-02 REMOTE TONG	each		2	_____
10058	DOOR CYL. REAR MOUNT F/CLE1075-02 (PICKLIST)	each		1	_____
10059L	LEFT LOAD CELL BRACKET PICK LIST	each		1	_____
10059R	RIGHT LOAD CELL BRACKET PICK LIST	each		1	_____
1006	ROLL PIN 3/16" X 1"	each	50	1	_____
10063	REV. CYL. STOP SPACER F/CLE1075-02	each		2	_____
10064	WEAR RING F/CLE1075-02	each		2	_____
10078	EXTE3NSION SPRING .75 OD .115 WIRE	each		2	_____
1008-B2	FLATWASHER 1/4" GR8	each	50	8	_____
10080	BOTTOM TONG PLATE WELDMENT PICKLIST	each		1	_____
10081	TOP TONG PLATE WELDMENT PICKLIST	each		1	_____
10085	SHIFTER SHAFT WELDMENT 3" EXTENSION PICKLIST	each		1	_____
10086	SUPPORT LUG	each		1	_____
10095	BUSHING TEFLON 1" OD X 3/4" ID X 3/4" L	each		2	_____

SUPERIOR MANUFACTURING

Pick List

CLE1075-02 / 10 3/4" REMOTE CASING TONG

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1009A	ROLL PIN 1/4" X 1 3/4"	each	50	1	_____
101	LOCKWASHER 1/4" GR8	each	55	8	_____
102	FLATWASHER 1/4" GR8	each	54	4	_____
1025	FLATWASHER 3/8" GR8	each	50	6	_____
1026	HI COLLAR LOCKWASHER 3/8"	each	50	8	_____
1027	LOCKWASHER 3/8" GR8 (134)	each	50	13	_____
1029	SET SCREW 3/8"-16 X 1/2"	each	50	10	_____
1034	SET SCREW 1/4" #10-32	each	50	1	_____
1040-A	SHCS 3/8"-16 X 3/4"	each	50	4	_____
1041	SHCS 3/8"-16 X 1"	each	50	16	_____
1048	HHCS 3/8"-16 X 1 1/4" GR8	each	50	10	_____
105	HHCS 1/4"-20 X 1" GR8	each	55	8	_____
1055	HHCS 3/8"-16 X 2 1/4" GR8	each	50	2	_____
1060	HHCS 3/8"-16 X 2 1/2" GR8	each	51	2	_____
1085	HHCS 7/16"-14 X 1 3/4" GR8	each	51	1	_____
1087	NYLOCK NUT 1/2"-13	each	51	1	_____
1099	ROD CLEVIS-RC-0605	each	51	1	_____
1101	NUT 1/2"-13 GR8	each	51	14	_____
1102	FLATWASHER 1/2" GR8	each	51	2	_____
1103	LOCKWASHER 1/2" GR8	each	51	33	_____
1106-A	SHCS 1/2"-13 X 1 1/2"	each	51	13	_____
1110	HHCS 1/2"-13 X 1" GR8	each	51	17	_____
1111	HHCS 1/2"-13 X 1 1/4" GR8	each	51	4	_____
1112	HHCS 1/2"-13 X 1 1/2" GR8	each	51	24	_____
1117-A	HHCS 1/2"-13 X 9 1/2" GR8	each	51	4	_____
1129	HHCS 1/2"-13 X 2 1/2" SS 316	each		2	_____
1131	NUT 1/2"-13 SS 316	each		2	_____

SUPERIOR MANUFACTURING

Pick List

CLE1075-02 / 10 3/4" REMOTE CASING TONG

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1150	JAM NUT 5/8"-18	each	51	40	
1151	5/8" LOCKWASHER GRADE 8	each	51	58	
1152	HI COLLAR LOCKWASHER 5/8"	each	51	40	
1153	SHCS 5/8"-11 X 1"	each	51	6	
1156	HHCS 5/8"-11 X 1 1/4" GR8	each	51	8	
1158	HHCS 5/8"-11 X 1 3/4" GR8	each	51	48	
1173	HHCS 3/4"-10 X 1 3/4" GR8	each	52	2	
1176	HHCS 3/4"-10 X 3" GR8	each	52	2	
1211	HHCS 1"-8 X 8" GR8	each	52	2	
1213	NYLOCK NUT LOW PRO 1"-12 NF	each	52	26	
1222	NUT 1 1/2"-12, IDLER GEAR	each	52	7	
1223	LOCKWASHER 1 1/2"	each	52	7	
1233	ALLEN NUT 3/4"-10	each	53	8	
12501437	POLYPACK 1/8" CROSS SECTION 1 7/16 X 1 11/16 X 1/8	each	O1-A	1	
1252	COTTER PIN 3/16" X 1 1/2" SS	each	53	5	
1252B	COTTER PIN 1/8" X 1" SS	each	53	2	
12DU12	3/4 X 3/4 DU BEARING	each	S2-F	1	
1311	SPRING PLUNGER	each	54	2	
13606	REVERSING PIN CYLINDER 1 1/2" B, 2"S W/5/8"R STAINLESS ROD	each	M1-C	2	
14005	LOW GEAR HOUSING WELDMENT PICKLIST	each		1	
14018	ROD BOOTS F/ CYLINDER H-1 1/2AO2-3-1-P1 W/ THIN BAND (1/4")	each	M1-C	4	
14049	PINION BEARING BUSHING F/ 14" TONG	each	M1-D	1	
14053	GARLOCK BUSHING 18DU12 1 1/8" X 3/4"	each	S2-F	2	

SUPERIOR MANUFACTURING

Pick List

CLE1075-02 / 10 3/4" REMOTE CASING TONG

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
14054	GARLOCK BUSHING 08DU12 1/2" ID X 3/4"	each	S2-F	2	_____
14060-01	BRAKE BAND CLEVIS F/ 10 3/4 TONG W/10024A BRAKE BAND	each		1	_____
14061	REAR BRAKE CLEVIS PIN REID CLP-168S	each	M1-E	6	_____
14070	DUMBELL ROLLER SEAL ASSEMBLY PICKLIST	each		28	_____
144	HHCS 3/8"-16 X 2 1/2" GR8	each	57	2	_____
147	HHCS 3/8"-16 X 3 1/2" GR8	each	57	2	_____
1607	FLUSH PLUG 1/8" NPT	each	S4-G	1	_____
1608	HEX PLUG O RING 3/8"	each	S4-G	1	_____
1609	FLUSH PLUG 3/8" NPT	each	S4-G	4	_____
1610	FLUSH PLUG 3/4" NPT	each	S4-G	1	_____
1611	FLUSH PLUG 1" MNPT	each	S4-G	1	_____
173	HHCS 1/2"-13 X 2 1/4" GR8	each	57	1	_____
175	HHCS 1/2"-13 X 2 3/4" GR8	each	57	1	_____
1900	BEARING 5308 MZZG	each	S5-D	1	_____
1901	BEARING 306 SZZ	each	S5-D	2	_____
1902	BEARING MRC5308MZZ	each	S5-D	2	_____
1903	BEARING 306 SZZC	each	S5-D	1	_____
1905	**CLINCHER®** IDLER BEARING X-tra Heavy Duty Sealed type MODIFIED MU5212TM BEARING	each	S5-D	4	_____
1908	BEARING MRC5208MZZ	each	S5-D	1	_____
1909	FAF9105KDD BEARING	each	S5-D	2	_____
1910B	TAPERED BEARING TIMK 30206 92KA1	each	S5-E	28	_____
1926	SNAP RING INT. RR-433 SPIROL LOC	each	S5-E	8	_____
1946	SNAP RING EXT. 237	each	S5-F	1	_____

SUPERIOR MANUFACTURING

Pick List

CLE1075-02 / 10 3/4" REMOTE CASING TONG

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1949	SNAP RING INT. N5000-187	each	S5-F	1	_____
1950	SNAP RING EXT. N5100-100	each	S5-F	1	_____
1954	SNAP RING INT. RR-314	each	S5-F	1	_____
1954-A	INNER RACE - NOLAN R-1916	each	S5-F	2	_____
1959	BEARING MRC5203-SBZZ	each	S5-F	1	_____
1968	CAM FOLLOWER-CF 1 1/2-SB W/ NEEDLE BEARING	each	S5-G	40	_____
2-153	O RING 3 1/2"ID X 3 11/16"OD 3/32"WIDTH	each		1	_____
2-234	O RING 3"ID X 3 1/4" OD 1/8"WIDTH	each	O2-F	1	_____
20015	DOOR SWITCH BASE PLATE 10 3/4" & 20" TONG	each	M2-A	1	_____
2008	ROD CLEVIS MOD. VERSION LYNAIR RC-0605--PT#1099	each	M2-B	2	_____
201	HHCS 5/8"-11 X 2 1/4" GR8	each	57	2	_____
2019	SLH-1 1/2 A02-3-1-P24P5 CYL. BRAKE CYL. S/S ROD MODIFY TANGS	each	M2-C	2	_____
2021	GARLOCK BUSHING 24DU16 1 1/2" ID X 1" DOOR BUSHING	each	S2-G	2	_____
2025	TONG DOOR THRUST SPACER	each	M2-C	1	_____
204	HHCS 5/8"-11 X 3" GR8	each	57	2	_____
2040	TONG DOOR BUSHING F 20" CASING TONG	each	M2-D	2	_____
2043	DOOR CYLINDER (LYNAIR) LH -1 1/2 -BO2 -4 1/2 -1-P4 ST STL ROD	each	M2-D	1	_____
2044	BALL JOINT ROD END RIGHT HAND THREADS	each	M2-D	1	_____
2047	AUTO SHIFT CYL. LH-11/2-BO2-2-1-P1 LYNAIR W/STAINLESS ROD	each		1	_____
2058	LOCKING PIN BASE PLATE WELDM F/20" CASING TONG PICKLIST	each		1	_____

SUPERIOR MANUFACTURING

Pick List

CLE1075-02 / 10 3/4" REMOTE CASING TONG

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
2061	DOOR SHAFT F/ REMOTE 20" CASING TONG	each	M2-D	1	_____
2062	DUMBELL ROLLER SHAFT - S/S F/5 1/2" UHT - 20" TONG	each	M2-D	9	_____
2065	DOOR SWITCH BRACKET F/REMOTE 20" CASING TONG	each	M2-E	1	_____
2069	HHCS 1/4"-20 X 6" GR8	each	M2-E	4	_____
2079	SPRING HOUSING F/AUTO SHIFT ASSY. 20" CASING TONG	each		1	_____
2080	PISTON ROD F/AUTO SHIFT ASSY. 20" CASING TONG	each		1	_____
2081	END CAP F/AUTO SHIFT ASSY. 20" CASING TONG	each		1	_____
2082	END CAP F/ AUTO SHIFT SPRING HSNG. 20" CASING TONG	each		1	_____
2094	DUMBELL ROLLER w/ SEAL GRV. F/ 20" TONGS	each	M2-E	14	_____
2095	DUMBELL ROLLER SPACER F/20" TONG	each	M2-E	28	_____
210	HI-COLLAR LOCKWASHER 1/2"	each	56	13	_____
2100	AUTO SHIFT SHAFT SPACER F/REMOTE 20" TONG CLE2000-02	each		1	_____
213	NYLOCK NUT 3/8"-16 GR8	each	56	8	_____
238	SHCS 3/8"-16 X 1 1/2"	each	56	34	_____
240	SHCS 3/8"-16 X 2 1/2"	each	56	2	_____
243	SHCS 3/8"-16 X 4"	each	56	2	_____
256	SHCS 5/8"-11 X 1 1/4"	each	56	2	_____
257	SHCS 5/8"-11 X 1 1/2"	each	56	6	_____
271	HEX NUT 5/8"-18 GR8	each	57	40	_____
280	FLATWASHER 3/4"	each	55	1	_____
292	7/16"-14 NYLOCK NUT GR8	each	56	1	_____

SUPERIOR MANUFACTURING

Pick List

CLE1075-02 / 10 3/4" REMOTE CASING TONG

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
41037	ALUM. WASHER	each	M3-C	4	_____
41067-S4	SHAFT BUSHING	each	M3-D	1	_____
45061	SHIFTING YOKE WELDMENT **F/ ELECTRONIC REMOTE TONG** **REPLACED W/ 45091 SHIFT ASSY**	each	M4-B	1	_____
45068	WASHER	each	M4-B	1	_____
45078	MOTOR GA01561015030 W/ 57 SEAL	each	S1-D	1	_____
55027-D	DUMBELL ROLLER SPACER f/ tapered roller bearing 5 1/2"UHT thru 20" HT	each	M5-D	14	_____
55036	PINION BEARING CAP-BOTTOM	each	M5-D	1	_____
55041	BOTTOM RETAINER BRNG. CAP	each		1	_____
55048BJ	SECONDARY INPUT GEAR	each	M6-A	1	_____
55049	IDLER GEAR W/O MICRO CAM	each	M6-A	3	_____
55066	TOP BEARING RETAINER	each		1	_____
55070	PRIMARY INPUT GEAR	each	M6-B&23-C	1	_____
55076	SHIFTING BOX WELDMENT PICKLIST	each	M6-B	1	_____
55084-02	DRIVE GEAR F/CLE5500	each	M6-B	1	_____
55085	MOTOR SPACER	each	M6-B	1	_____
55086-A	MOTOR SHAFT	each	M6-B	1	_____
55088	MOTOR SHAFT SEAL RETAINER	each	M6-B	1	_____
55119	HIGH GEAR	each	M6-C	1	_____
55121-01	MOTOR SHAFT BEARNG SPACER	each		1	_____
55122-01	HIGH GEAR RETAINER F/ 5 1/2 HT & 7 5/8 TONG	each	M6-C	1	_____
55123	HIGH GEAR IDLER	each	M6-C	1	_____
55131	SPACER	each	M6-C	1	_____
55143	TOP SECONDARY BEARING CAP	each		1	_____

SUPERIOR MANUFACTURING

Pick List

CLE1075-02 / 10 3/4" REMOTE CASING TONG

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
55161-BJ	LOW PINION GEAR F/ 7 5/8 BJ TONG	each	M6-D	1	_____
58079	GARLOCK BUSH 20DU12 1 1/4" ID X 3/4"	each	M2-F	2	_____
58087	PRESSURE RED. VALVE 1PA11-F310-SV DANFOSS	each	M7-C	1	_____
71073	LOCKING PIN CROSS BAR 7 5/8" LOCKJAW TONG	each	M8-A	2	_____
73038	PINION GEAR F/ CLE7625DP-35 1st.UNIT	each	M8-E	1	_____
76049	7 5/8 **CLINCHER®** IDLER GEAR	each	M10-E	1	_____
76050-01	OUTBOARD IDLER SHAFT	each	M10-B	3	_____
76051-01	IDLER SHAFT	each	M10-B	1	_____
76097	OUTBOARD IDLER SHAFT SPACER	each	M10-D	3	_____
76131	DOOR SWITCH ADJ. SLEEVE	each	M10-E	1	_____
959-1	1/2" ROD WIPER	each	O3-F	1	_____
BUCS4024	B1000-035 BELVILLE SPRING B4-25-89	each	M14-C	66	_____
CRSS10031	VARCO ENCODER ADAPTOR	each	M18-F	1	_____
OR1000	ENCODER ADAPTOR ASSEMBLY	each	M18-F	1	_____
OR102	ENCODER COUPLING	each	M18-F	1	_____
RSN-100	SNAP RING EXT. RSN-100	each		1	_____

SUPERIOR MANUFACTURING

Pick List

10010 / MID BODY F/10 3/4" TONG

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
10010-S1	FRONT RADIUS F/MID BODY ON 10 3/4" TONG	each		2	_____
10032	10 3/4 NUMBER SET	each	M1-A	2	_____
10033	REAR HANDLE	each	M1-B	2	_____
14003-S6	FRONTTONG LEG WELD-PICK LIST CLE14000 & 20000	each	18-A	2	_____
14039	REAR PADEYE	each		1	_____
55044-S5	**CLINCHER®** H.T. NAME PLATE LARGE	each	M5-E	2	_____
72001-S2	FRONT SIDE F/MID BODY	each		2	_____
72001-S3	REAR SIDE F/MID BODY	each		2	_____
72001-S4	REAR RADIUS F/MID BODY	each		2	_____
72001-S5	REAR F/MID BODY	each		1	_____

6-Nov-02
2:20 PM

SUPERIOR MANUFACTURING

Pick List

10012-01 / TONG DOOR ASSY.

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
10012-02-S1	TONG DOOR PLATE F/10012-02 DOOR ASSY.	each		2	_____
10012-S2	DOOR COVER	each		1	_____
10012-S3	GUSSET F/10012-02 TONG DOOR	each	13-C	1	_____
14004-S4	DOOR PLATE SPACER	each	M1-C	2	_____
2012-S4	TIE ROD MOUNT F/ 20" CASING TONG	each	19-B	1	_____
45067-S7	DOOR SWITCH BASE MOUNT	each	M4-B	2	_____
45099	DOOR CAUTION PLATES F/ ALL TONG DOORS	each	M4-C	1	_____
55113-S4	TONG DOOR HANDLE	each	M6-C	1	_____
76113-S5	DOOR SWITCH COLLAR	each	MFG-10-D	1	_____

6-Nov-02
2:21 PM

SUPERIOR MANUFACTURING

Pick List

10024A / BRAKE BAND ASSEMBLY-NEWSTYLE

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
10024A-S1	BRAKE BAND RING	each		1	_____
10024A-S2	BRAKE BAND GUSSET	each		2	_____
10024A-S3	BRAKE BAND SUPPORT PLATE	each		1	_____
14041-S3	BRAKE BAND PIN	each	M1-D	2	_____
1663	1/4 X 2" BRAKE BAND MAT. x 25 FT LG ROLL	each	SR-10-A	1	_____

21-Nov-02
9:18 AM

SUPERIOR MANUFACTURING

Pick List

10059L / LEFT LOAD CELL BRACKET

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
10059-S1	TOP & BOTTOM PLATE F/LOAD CELL BRACKET	each		2	_____
10059-S2	SIDE PLATE F/LOAD CELL BRKT.	each		1	_____
10059-S3	SIDE PLATE F/LOAD CELL BRKT.	each		1	_____
1027	LOCKWASHER 3/8" GR8 (134)	each	50	6	_____
1048	HHCS 3/8"-16 X 1 1/4" GR8	each	50	6	_____
BUCS2171	TONG LIFTING EYE F/20" TONG	each		1	_____
BUCS2180-S4	LOAD CELL SEAT F/20" TONG	each	MFG-14-A	1	_____
BUCS2181-S1	ANTI-SWIVEL BAR EXTENSION	each	M14-A	1	_____

21-Nov-02
9:19 AM

SUPERIOR MANUFACTURING

Pick List

10059R / RIGHT LOAD CELL BRACKET

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
10059-S1	TOP & BOTTOM PLATE F/LOAD CELL BRACKET	each		2	_____
10059-S2	SIDE PLATE F/LOAD CELL BRKT.	each		1	_____
10059-S3	SIDE PLATE F/LOAD CELL BRKT.	each		1	_____
1027	LOCKWASHER 3/8" GR8 (134)	each	50	6	_____
1048	HHCS 3/8"-16 X 1 1/4" GR8	each	50	6	_____
BUCS2171	TONG LIFTING EYE F/20" TONG	each		1	_____
BUCS2180-S4	LOAD CELL SEAT F/20" TONG	each	MFG-14-A	1	_____
BUCS2181-S1	ANTI-SWIVEL BAR EXTENSION	each	M14-A	1	_____

6-Nov-02
2:23 PM

SUPERIOR MANUFACTURING

Pick List

10080 / BOTTOM TONG PLATE WELDMENT

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
10001-01	BOTTOM TONG PLATE	each		1	_____
10019-01	CYLINDER MOUNTING SHAFT	each		2	_____
10038	BRAKE REAR CLEVIS PIN	each	17-A	1	_____
2003-S1	TONG LEG F/20" CASING TONG	each	M2-B	2	_____
55063-S1	DOOR JAM 1 1/4" X 1 3/4"	each	M6-A	1	_____

12-Nov-02
9:47 AM

SUPERIOR MANUFACTURING

Pick List

10081 / TOP TONG PLATE WELDMENT

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
10081	PICKLIST FOR 10081 REV DATE: 11/12/02	each	MFG-10-A	1	_____
10002-02	TOP TONG PLATE F/CLE1075-02	each		1	_____
10002-S1	HANDLE LENGTH NAME PLATE 40 F/10 3/4 & 14" CASING TONGS	each	M1-A	1	_____
55063-S1	DOOR JAM 1 1/4" X 1 3/4"	each	M6-A	2	_____
55063-S3	PINION TOP BEARING RETAINER	each	M6-A	1	_____
55063-S4	BEARING RETAINR F/MTR. SHFT	each	M6-A	1	_____
55124	IDLER GEAR SHAFT	each	M6-C	1	_____

SUPERIOR MANUFACTURING

Pick List

OR1000 / ENCODER ADAPTER ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1008-B1	HI COLLAR LOCKWASHER 1/4"	each	50	6	_____
1034	SET SCREW 1/4" #10-32	each	50	1	_____
1040-A	SHCS 3/8"-16 X 3/4"	each	50	2	_____
215	SHCS 1/4"-20 X 3/4"	each	56	6	_____
OR100	ENCODER ADAPTOR BASE PLATE	each	MFG-18-F	1	_____
OR101	ENCODER ADAPTOR CLAMP	each	MFG-18-F	2	_____
OR102	ENCODER COUPLING	each	M18-F	1	_____
OR103	ENCODER ADAPTOR COVER PLATE	each	MFG-18-F	1	_____

3-Dec-02
7:56 AM

SUPERIOR MANUFACTURING

Pick List

CJ-10A / 10 3/4" JAW SET ASSY SS PIN

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
10014	JAW ROLLER	each	M1-A	2	_____
10026	TONG JAW F/CJ-10 ASSY'S F/10 3/4" CASING TONG	each	M1-A	2	_____
10027	10 3/4" DIE CLIP	each	M1-A	8	_____
10035-01	JAW SPRING RETAINER POST F/10 3/4" TONG	each	M1-B	2	_____
1008-C	SHCS 1/4"-20 X 1/2"	each	50	16	_____
10131	S.S. JAW ROLLER PIN F/ 10 3/4 VARCO TONG	each	M10-A	2	_____

3-Dec-02
7:56 AM

SUPERIOR MANUFACTURING

Pick List

CJ-10A / 10 3/4" JAW SET ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
10014	JAW ROLLER	each	M1-A	2	_____
10026	TONG JAW F/CJ-10 ASSY'S F/10 3/4" CASING TONG	each	M1-A	2	_____
10027	10 3/4" DIE CLIP	each	M1-A	8	_____
10031	JAW ROLLER PIN	each	M1-A	2	_____
10035-01	JAW SPRING RETAINER POST F/10 3/4" TONG	each	M1-B	2	_____
1008-C	SHCS 1/4"-20 X 1/2"	each	50	16	_____

3-Dec-02
7:56 AM

SUPERIOR MANUFACTURING

Pick List

CJ-LF-10A / 10 3/4" LF JAW SET S/S PIN

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
10014LF	LOW FRICTION JAW ROLLER F/CJ-LF-10A(10 3/4"JAW ASSY)	each	M1-A	2	_____
10027	10 3/4" DIE CLIP	each	M1-A	8	_____
10035-01	JAW SPRING RETAINER POST F/10 3/4" TONG	each	M1-B	2	_____
10045	LOW FRICTION TONG JAW F/10 3/4" TONG	each		2	_____
1008-C	SHCS 1/4"-20 X 1/2"	each	50	16	_____
10131LF	S.S. LF JAW PIN F/CJ-LF-(10 3/4")	each	M10-A	2	_____
22DU16	GARLOCK BUSHING	each	S2-G	2	_____
22DU24	GARLOCK BUSHING-22DU24	each	S2-G	2	_____

3-Dec-02
7:57 AM

SUPERIOR MANUFACTURING

Pick List

CJ-LF-10B / 10 3/4" LF JAW SET ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
10014LF	LOW FRICTION JAW ROLLER F/CJ-LF-10A(10 3/4"JAW ASSY)	each	M1-A	2	_____
10027	10 3/4" DIE CLIP	each	M1-A	8	_____
10031LF	LOW FRICTION JAW ROLLER PIN F/CJ-LF-10A(10 3/4" JAW ASSY)	each	M1-A	2	_____
10035-01	JAW SPRING RETAINER POST F/10 3/4" TONG	each	M1-B	2	_____
10045	LOW FRICTION TONG JAW F/10 3/4" TONG	each		2	_____
1008-C	SHCS 1/4"-20 X 1/2"	each	50	16	_____
22DU16	GARLOCK BUSHING	each	S2-G	2	_____
22DU24	GARLOCK BUSHING-22DU24	each	S2-G	2	_____

SUPERIOR MANUFACTURING

Pick List

CJDT10-1025R / 10 1/4" DOVETAIL JAW SET ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
10014	JAW ROLLER	each	M1-A	2	_____
10031	JAW ROLLER PIN	each	M1-A	2	_____
10035-01	JAW SPRING RETAINER POST F/10 3/4" TONG	each	M1-B	2	_____
10070L	10 1/4" LEFT TONG JAW F/10 3/4 TONG	each	MFG-10-A	1	_____
10070R	10 1/4" RIGHT TONG JAW F/10 3/4 TONG	each	MFG-10-A	1	_____
1027	LOCKWASHER 3/8" GR8 (134)	each	50	4	_____
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4	_____

7-Nov-02
7:03 AM

SUPERIOR MANUFACTURING

Pick List

CJDT10-9875R / 9 7/8" DOVETAIL JAW SET ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
10014	JAW ROLLER	each	M1-A	2	_____
10031	JAW ROLLER PIN	each	M1-A	2	_____
10035-01	JAW SPRING RETAINER POST F/10 3/4" TONG	each	M1-B	2	_____
10052-L	9 7/8" DOVETAIL TONG JAW LEFT SIDE FORMERLY P/N: 10026-02	each		1	_____
10052-R	9 7/8 DOVETAIL TONG JAW RIGHT SIDE FORMERLY P/N :10026-01	each	17-A	1	_____
1027	LOCKWASHER 3/8" GR8 (134)	each	50	4	_____
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4	_____

7-Nov-02
7:03 AM

SUPERIOR MANUFACTURING

Pick List

CJDT10-9875 / 9 7/8" DOVETAIL JAW SET ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
10014	JAW ROLLER	each	M1-A	2	_____
10035-01	JAW SPRING RETAINER POST F/10 3/4" TONG	each	M1-B	2	_____
10052-L	9 7/8" DOVETAIL TONG JAW LEFT SIDE FORMERLY P/N: 10026-02	each		1	_____
10052-R	9 7/8 DOVETAIL TONG JAW RIGHT SIDE FORMERLY P/N :10026-01	each	17-A	1	_____
10131	S.S. JAW ROLLER PIN F/ 10 3/4 TONG	each	M10-A	2	_____
1027	LOCKWASHER 3/8" GR8 (134)	each	50	4	_____
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4	_____

SUPERIOR MANUFACTURING

Pick List

BUCS1175-01 / 11 3/4" LOCKJAW BACKUP

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
00BUCS117501	PICKLIST FOR BUCS1175-01 FOR CASING SUSPENSION SYSTEM REV DATE: 03/17/03	each		1	_____
1001	ZERT 1/8" NPT	each	50	8	_____
1040-A	SHCS 3/8"-16 X 3/4"	each	50	4	_____
1041	SHCS 3/8"-16 X 1"	each	50	12	_____
1170-A	HI COLLAR LOCKWASHER 3/4"	each	52	2	_____
1171	LOCKWASHER 3/4" GR8	each	52	58	_____
1174	HHCS 3/4"-10 X 2 1/4" GR8	each	52	28	_____
1176	HHCS 3/4"-10 X 3" GR8	each	52	24	_____
1176-A	NUT COARSE 3/4" GR8	each	52	6	_____
1178-A	SHCS 3/4"-10 X 6 1/2"	each	52	6	_____
1184	SHCS 3/4"-10 X 8 1/2" GR8	each	52	6	_____
1219	JAM NUT 1 1/4"-12	each	52	3	_____
1223	LOCKWASHER 1 1/2"	each	52	1	_____
1224-B	NYLOCK NUT 1"-8	each	52	8	_____
1252	COTTER PIN 3/16" X 1 1/2" SS	each	53	4	_____
1264	HHCS 1"-8 X 2 1/2" GR8	each	53	8	_____
1370	1" UNION 3000#	each	S3-C	2	_____
1377	THRDED.COUPLING 3/4" 3000PSI	each	S3-D	1	_____
1579-B	VENT 1/8"NPT HUBER P/N MV001A	each	S4-E	1	_____
1607	FLUSH PLUG 1/8" NPT	each	S4-G	4	_____
1611	FLUSH PLUG 1" MNPT	each	S4-G	4	_____
1650	GAUGE 0-3000 BAC-3M-25	each	S5-A	1	_____
1800	PARKER FLOW CONTROL F600	each	S5-C	1	_____
32DU24	GARLOCK BUSHING 32DU24 2" ID X 1 1/2"	each	S2-G	8	_____
40028	PROTECTOR SLEEVE F/ DOOR SWITCHES(SLV1000-01)	each	M3-B	1	_____

SUPERIOR MANUFACTURING

Pick List

BUCS1175-01 / 11 3/4" LOCKJAW BACKUP

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
BUC5524	PILOT OPER CHK VALVE-STEEL (5000 PSI)	each	M12-C	1	_____
BUCS11001	TOP PLATE WELDMENT FOR 11 3/4 LOCKJAW BACKUP PICKLIST	each		1	_____
BUCS11002	REAR JAW GUIDE F/11 3/4" LOCKJAW BACKUP	each		4	_____
BUCS11003	CYLINDER BRACKET WELD. PICK LIST	each		1	_____
BUCS11006	TOP PLATE F/CENTER JAW F/11 3/4" LOCKJAW BACKUP	each		1	_____
BUCS11007	BOTTOM PLATE F/CENTER JAW F/11 3/4" LOCKJAW BACKUP	each		1	_____
BUCS11010	BOTTOM PROTECTOR RING	each	M13-E	2	_____
BUCS11015	SPRING RETAINER BRACKET	each		2	_____
BUCS11018	WEDGE PLATE WELDMENT PICKLIST	each		1	_____
BUCS11020	BOTTOM PLATE WELDMENT FOR 11 3/4 LOCKJAW BACKUP PICKLIST	each		1	_____
BUCS11021	CENTER JAW INSERT F/11 3/4 LOCKJAW BACKUPS	each		1	_____
BUCS1176	INSIDE DOOR ASSEMBLY F/BUCS1175-01 LJ BACKUP PICKLIST	each		1	_____
BUCS1177	OUTSIDE DOOR ASSEMBLY F/BUCS1175-01 LJ BACKUP PICKLIST	each		1	_____
BUCS2140	HHCS 1 1/2"-6 X 5" GR8	each	M13-F	1	_____
BUCS2141	1 1/2"-6 NUT	each	M13-F	1	_____
BUCS8606	COLUMN F/BUCS8625	each	M15-B	18	_____
BUCST1510	REAR JAW PLATE SPACER	each	M15-C	6	_____
BUCST1520	ROD EYE PIN	each	M15-D	1	_____
BUCST7623	1/2 NPT BULKHEAD CONNECTOR	each	M15-E	3	_____

SUPERIOR MANUFACTURING

Pick List

BUCS1175-01 / 11 3/4" LOCKJAW BACKUP

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
CLEBU1121	DIE ADAPTOR RETAINER CLIP F/ 11 3/4 BUCKING UNIT	each	M16-B	2	_____
CM4554	3/8" CHECK VALVE FLUID CONTROLS 3C12-3-3 J91A	each	M17-E	2	_____
CM7654	PSI REDUCING VALVE (SUN) 3/8 NPT PORTS	each	M18-C	1	_____
MA10-ACNC-04	2 WAY CAM OPERATED VALVE	each	S3-C	1	_____
SHC1175	CYLINDER ASSEMBLY PICKLIST	each		1	_____
SMH1501-S	3.875 X 3.25 X 11.5 COMPRESSION SPRING	each		2	_____

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SUPERIOR MANUFACTURING

Pick List

BUCS11001 / TOP PLATE WELDMENT

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1384	1" HALF COUPLING 3000 PSI	each	S3-D	2	_____
BUCS11001-S1	TOP PLATE FOR 11 3/4 LOCKJAW BACKUP	each	M10-A	1	_____
BUCST7603-S5	DUBBLER F/ LOCKJAW BACKUP	each	M15-E	2	_____

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SUPERIOR MANUFACTURING

Pick List

BUCS11020 / BOTTOM PLATE WELDMENT

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1384	1" HALF COUPLING 3000 PSI	each	S3-D	2	_____
BUCS11020-S1	BOTTOM PLATE FOR 11 3/4 LOCKJAW BACKUP	each	M10-A	1	_____
BUCST7603-S5	DUBBLER F/ LOCKJAW BACKUP	each	M15-E	2	_____

SUPERIOR MANUFACTURING

Pick List

BUCS1176 / INSIDE DOOR ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
00BUCS1176	PICKLIST FOR BUCS1176 REV DATE: 11/13/02	each	MFG-10-A	1	_____
1001	ZERT 1/8" NPT	each	50	4	_____
1040-A	SHCS 3/8"-16 X 3/4"	each	50	4	_____
1171	LOCKWASHER 3/4" GR8	each	52	3	_____
1176-A	NUT COARSE 3/4" GR8	each	52	3	_____
1184	SHCS 3/4"-10 X 8 1/2" GR8	each	52	3	_____
32DU24	GARLOCK BUSHING 2" I.D. x 1.5	each	S2-G	2	_____
BUCS11004	INSERT F/11 3/4" LJ BACKUP	each	M13-E	1	_____
BUCS11013	INSIDE DOOR PLATE F/BUCS1175-01	each		2	_____
BUCS11014	DOOR ROLLER	each	MFG-13-E	1	_____
BUCS11019	SPRING SPACER	each		1	_____
BUCS2145	PIVOT PIN F/21" LJ BACKUP	each	M13-F	1	_____
BUCS2193	EXT. SPIROLOX RST-200	each	MFG-14-A	1	_____
BUCST7615	PIVOT PIN SPACER F/7 5/8" LJ B/U TENSION STYL	each	MFG-15-E	2	_____
BUCST7617	DOOR ROLLER PIN FOR 7 5/8 LJ BUC.TENSION ST.	each	MFG-15-E	1	_____
CLE18528	RIGHT HAND TORSION SPRING F/ CLE185 3/8"W x 2 1/2 I.D x 5 COILS	each	MFG-16-B	1	_____
CLEBU1121	DIE ADAPTOR RETAINER CLIP F/ 11 3/4 BUCKING UNIT	each	MFG-16-B	2	_____

SUPERIOR MANUFACTURING

Pick List

BUCS1177 / OUTSIDE DOOR ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
00BUCS1177	PICKLIST FOR BUCS1177 REV DATE: 11/13/02	each	MFG-10-A	1	_____
1001	ZERT 1/8" NPT	each	50	4	_____
1040-A	SHCS 3/8"-16 X 3/4"	each	50	4	_____
1171	LOCKWASHER 3/4" GR8	each	52	3	_____
1176-A	NUT COARSE 3/4" GR8	each	52	3	_____
1184	SHCS 3/4"-10 X 8 1/2" GR8	each	52	3	_____
32DU24	GARLOCK BUSHING 2" I.D. x 1.5	each	S2-G	2	_____
BUCS11004	INSERT F/11 3/4" LJ BACKUP	each	M13-E	1	_____
BUCS11012	OUTSIDE DOOR PLATE	each		2	_____
BUCS11014	DOOR ROLLER	each	MFG-13-E	1	_____
BUCS11019	SPRING SPACER	each		1	_____
BUCS2145	PIVOT PIN F/21" LJ BACKUP	each	M13-F	1	_____
BUCS2193	EXT. SPIROLOX RST-200	each	MFG-14-A	1	_____
BUCST7615	PIVOT PIN SPACER F/7 5/8" LJ B/U TENSION STYL	each	MFG-15-E	2	_____
BUCST7617	DOOR ROLLER PIN FOR 7 5/8 LJ BUC.TENSION ST.	each	MFG-15-E	1	_____
CLE18527	LEFT HAND TORSION SPRING F/ CLE185 UNIT 3/8"W x 2 1/2 I.D x 5 COILS	each	MFG-16-B	1	_____
CLEBU1121	DIE ADAPTOR RETAINER CLIP F/ 11 3/4 BUCKING UNIT	each	MFG-16-B	2	_____

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SUPERIOR MANUFACTURING

Pick List

SHC1175 / CYLINDER ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
00SHC1175	PICKLIST FOR SHC1175 REV DATE: 11/22/02	each	M10-A	1	_____
1005-S	1/4"-20 X 3/4" SET SCREW	each		1	_____
1015-A	SH SET SCREW 1/4"-20 X 1/2" SOC. HD W/ NYLON PLUG (PELLET)	each	50	1	_____
1223-A	STOVER LOCK NUT 2" -12 ALL METAL	each	52	1	_____
ASAP1175	SEAL KIT F/BUCS1175 & BUCS21	each	M10-A	1	_____
SHC1101	CYLINDER ROD	each	13-C	1	_____
SHC1102	CYLINDER BARREL WELDMENT PICKLIST	each	M10-A	1	_____
SHC1176	CYLINDER STOP	each	MFG-10-A	1	_____
SHC6002	PISTON	each	M19-C	1	_____
SHC6003	GLAND	each	M19-C	1	_____
SHC6004	CYLINDER GLAND RETAINER	each	M19-C	1	_____

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SUPERIOR MANUFACTURING

Pick List

SHC1102 / CYLINDER BARREL WELDMENT

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1383	3/4" HALF COUPLING 3000 PSI	each	S3-D	2	_____
BUCS2116	CYLINDER CLEVIS F/21" LOCKJAW BACKUP	each		1	_____
SHC6001-S1	CYLINDER BARREL	each		1	_____
SHC6001-S2	CYLINDER BARREL END CAP	each	MFG-19-C	1	_____

SUPERIOR MANUFACTURING

Pick List

ASAP1175 / SEAL KIT F/BUCS1175 & BUCS21

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
2-138	O RING-2 1/8"ID 2 5/16"OD 3/32"WIDTH	each	O2-D	1	_____
2-358	O RING-5 5/8"ID 6"OD 3/16"WIDTH	each	O3-B	1	_____
25003000-375	POLYPACK 1/4" CROSS SECTION 3 X 3 1/2 X 3/8	each	O1-C	1	_____
37505250	POLYPACK 3/8" CROSS SECTION 5 1/4 X 6 X 3/8	each	O1-E	2	_____
8-358	BACK UP RING	each		1	_____
D3000	ROD WIPER 3"ID 3 1/2"OD 3/8"HGT. 1/4"BASE THK.	each	O4-B	1	_____

SUPERIOR MANUFACTURING

Pick List

CRSS10750 / 10 3/4" SUSPENSION SYSTEM

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
00CRSS10750	PICKLIST FOR CRSS10750 REV DATE: 03/18/03	each		1	_____
10059L	LEFT LOAD CELL BRACKET PICK LIST	each		1	_____
10059R	RIGHT LOAD CELL BRACKET PICK LIST	each		1	_____
1170-A	HI COLLAR LOCKWASHER 3/4"	each	52	2	_____
1171	LOCKWASHER 3/4" GR8	each	52	14	_____
1171-A	SHCS 3/4"-10 X 1 1/4"	each	52	2	_____
1174	HHCS 3/4"-10 X 2 1/4" GR8	each	52	14	_____
1207A	NYLOCK NUT LOW PRO 1 1/8"-12 GR8	each	52	18	_____
1210	NUT 1"-8 GR8	each	52	8	_____
1979	CFH-2-SB CAM. FOL	each	S5-G	18	_____
40027-S3	5/16" CONNECTING LINK GR.80	each	M3-B	9	_____
55001-02	3/4" X 6 TURNBUCKLE (E X E)	each	M5-A	3	_____
BUCS2151	LARGE BRONSE BUSHED SHEAVE 4 1/8 X 3/8 WIRE X 1 SHAFT (STK #460414)	each		2	_____
BUCS2152	LARGE SPRING (LH WOUND) 4.75 O.D x .531 W x 34.5 L R=66.64 IN/LBS.	each		2	_____
BUCS2153	LARGE SHEAVE PIN F/SUSPESNION SYSTEM CRSS20000	each		2	_____
BUCS2154	LARGE SHEAVE SPACER F/SUSPENSION SYSTEM CRSS20000	each		4	_____
BUCS2156	LARGE SPRING PLUNGER F/ SUSPENSION SYSTEM CRSS20000	each		2	_____
BUCS2157	SPRING CABLE ASSY. FOR HYTOPS SUSPENSION SYSTEMS (PICKLIST)	each	M22-B	4	_____

SUPERIOR MANUFACTURING

Pick List

CRSS10750 / 10 3/4" SUSPENSION SYSTEM

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
BUCS2165	SMALL BRONSE BUSHED SHEAVE 3x3/8 wire x 3/4 shaft (STK# 460147)	each		2	_____
BUCS2166	SMALL SPRING (LH WOUND) 4 O.D x .406 W x 34.5 L R=33.33 LBS./IN.	each		2	_____
BUCS2166-A	SMALL INNER SPRING (RH WOUND) 3x.3125 W X 34.5 L R=16.67 lbs./in.	each		2	_____
BUCS2168	SMALL SHEAVE SPACER F/SUSPENSION SYSTEM CRSS20000	each	M13-F	4	_____
BUCS2170	SMALL SPRING PLUNGER F/ SUSPENSION SYSTEM CRSS20000	each	M14-A	2	_____
BUCS2190	RAIL KEEPER F/20/21 SUSPENSION SYSTEM CRSS20000	each	M23-C	2	_____
BUCS2196	TRANSPORT EYE BOLTS F/CRSS20000 SUSPENSION SYS 5/8-11 x 1 3/4" LONG	each		6	_____
BUCS2197	SMALL SHEAVE PIN F/SUSPENSION SYSTEM CRSS20000	each	M14-A	2	_____
BUCS4023	FLATWASHER 1"	each	M14-C	4	_____
CRSS10007	SUSPENSION SYSTEM FRAME PICKLIST	each		1	_____
CRSS10099	3/8" SHACKLE W/LOCKING PIN	each		6	_____
CRSS20092	UPPER TRANSPORT CHAIN (5) LINKS GRD.8	each		3	_____
CRSS20093	LOWER TRANSPORT CHAIN (13) LINKS GRD.8	each		1	_____
CRSS20098	TRANSPORT CHAIN (7) LINKS GR.8	each		2	_____

SUPERIOR MANUFACTURING

Pick List

CRSS10750-01 / 10.75/11.75 VARCO SYSTEM

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
00CRSS107501	PICKLIST FOR CRSS10750-01 ELECTRONIC SENSOR CK REV DATE: 04/23/03	each		1	_____
30153892	MAIN VALVE MOUNT WELDMENT PICK LIST	each		1	_____
30154096	DO3 VALVE MOUNT WELDMENT PICK LIST	each		1	_____
30154163-1	LARGE HOOK	each		2	_____
30154163-10	VARCO PLATE	each		1	_____
30154163-11	VARCO PLATE	each		1	_____
30154163-12	VARCO PLATE	each		1	_____
30154163-13	VARCO PLATE	each		1	_____
30154163-17	VARCO PLATE	each		2	_____
30154163-2	SMALL HOOK	each		2	_____
30154163-4	PANEL	each		1	_____
30154163-5	HOOK BASE	each		2	_____
30154163-6	TOP CAP	each		2	_____
30154163-7	LARGE BUMPER	each		2	_____
30154163-8	BOTTOM CAP	each		2	_____
30154163-9	VARCO PLATE	each	M19-F	1	_____
76128-1	BACKUP SENSOR MOUNT WELD PICK LIST	each		1	_____
76129	BACKUP SENSOR MOUNT WELD 11 3/4 & 21" REMOVE **CLINCHER®** BACKUP (VARCO)-PICK LIST	each		1	_____
CRSS10032	CAGE PLATE SENSOR BRACKET 10 3/4" VARCO REMOTE TONG	each		1	_____
CRSS10033	CAGE PLATE TARGET	each		1	_____
CRSS10034	DOOR SLEEVE TARGET REMOTE 10 3/4" & 20" TONG	each	M18-F	1	_____
CRSS10035	DOOR SENSOR BRACKET WELD 10 3/4" REMOTE TONG PICK LIST	each		1	_____

ACCESSORIES AND OPTIONS

Several different accessory items are available for the **CLINCHER®** Tong and Backup to allow them to be customized to provide a system most appropriate for the inducer's application.

CLE1075-02 Tong Accessories

Compression Load Cell and Torque Gauge	directly measures applied torque
Tension Load Cell and Torque Gauge	directly measures applied torque
Tong Handles with closed covers	protects operators hands
Solenoid Operated Module for Dump Valve	allows computer to limit torque applied
Adapter for Turns Proximity Switch	allows computer to sense rotation
3 Point Lifting Bridle	alternative lifting system
Lift Cylinder with Integral Spring Hanger	controls vertical position
TSP-80 Tong Speed Control	allows slow speed rotation with full torque
2 Speed Motors	
Alternate Motor Displacements	
Hydraulically Operated Cage Plate Brake System	

BUCS1175-01 Backup Accessories

Backup Handles	simplifies manipulation
Shipping Skids and Cages	simplify handling, transport and help guard against damage

ACCESSORIES AND OPTIONS

Hydraulically Operated Cage Plate Brake System

This system replaces the springs used to energize the cage plate brake band. When the tong motor is activated, hydraulic pressure is directed through a pressure reducing valve set at 250 to 300 psi. This low pressure fluid is then directed through a directional control valve system and on to a pair of hydraulic cylinders connected to the brake band. This pressure creates the brake band resistance required to cause the relative rotation between the cage plate assembly and the ring gear required to activate the jaws. At high torques when the motor pressure exceeds approximately 2000 psi the directional control valve shifts to shut off hydraulic fluid into the brake cylinder. Pressure contained within the cylinders is allowed to bleed off through a fixed orifice to a level equivalent to system back pressure. Relieving this pressure reduces brake friction at a time when it is not required because the jaws have already been actuated, thus increasing overall tong efficiency.

If brake performance appears to be less than required, pressure can be increased by adjusting the regulator stem on the pressure reducing valve. We do not recommend that brake system pressure be allowed to exceed 500 psi as shown on pressure gauge attached to the directional control valve.

Note: Refer to Varco Schematic.

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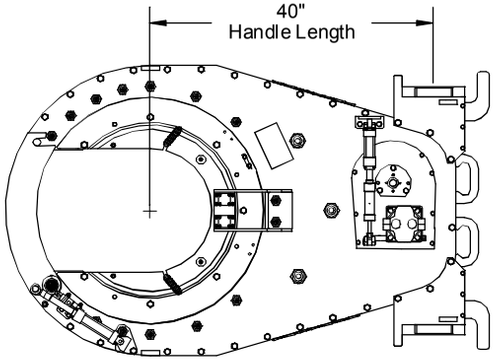
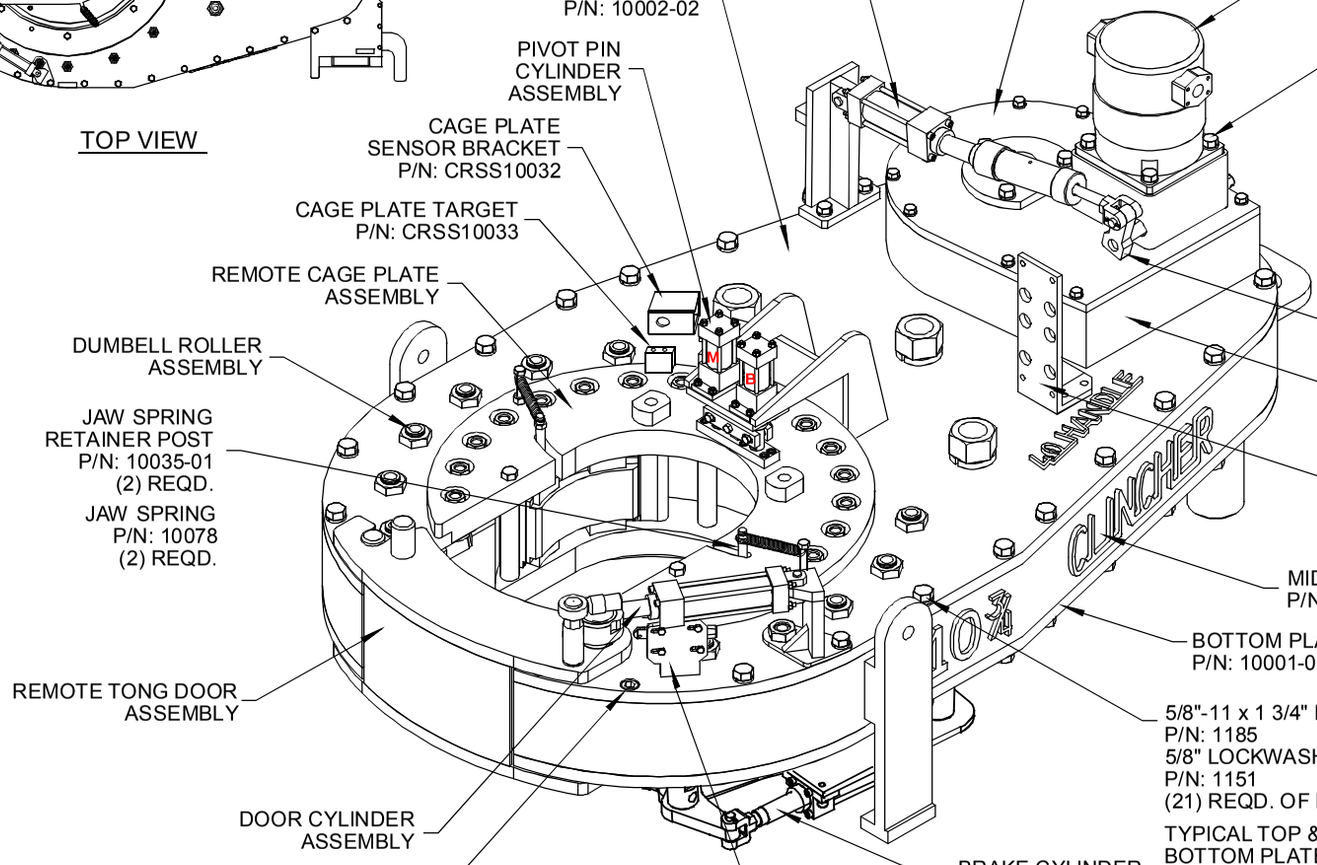


TOP VIEW



LOW GEAR HOUSING COVER
P/N: 10011

3/8"-16 x 4 1/2" HHCS
P/N: 1075
3/8" LOCKWASHER
P/N: 1027
(8) REQD. OF EACH

REMOTE SHIFT
CYLINDER ASSEMBLY

RINEER MOTOR
P/N: 45078

TOP PLATE
P/N: 10002-02

1/2"-13 x 1 1/4" HHCS
P/N: 1111
1/2" LOCKWASHER
P/N: 1103
(4) REQD. OF EACH

PIVOT PIN
CYLINDER
ASSEMBLY

CAGE PLATE
SENSOR BRACKET
P/N: CRSS10032

CAGE PLATE TARGET
P/N: CRSS10033

REMOTE CAGE PLATE
ASSEMBLY

DUMBELL ROLLER
ASSEMBLY

REMOTE SHIFT
ASSEMBLY

JAW SPRING
RETAINER POST
P/N: 10035-01
(2) REQD.

JAW SPRING
P/N: 10078
(2) REQD.

LOW GEAR HOUSING
P/N: 14005

DO3 VALVE MOUNT
WELDMENT
P/N: 30154096

MID BODY
P/N: 10010

BOTTOM PLATE
P/N: 10001-01

REMOTE TONG DOOR
ASSEMBLY

5/8"-11 x 1 3/4" HHCS
P/N: 1185
5/8" LOCKWASHER
P/N: 1151
(21) REQD. OF EACH

TYPICAL TOP &
BOTTOM PLATE

DOOR CYLINDER
ASSEMBLY

BRAKE CYLINDER
ASSEMBLY

5/8"-11 x 1" SHCS
P/N: 1153
(3) REQD.
TYPICAL TOP & BOTTOM PLATE

DOOR SWITCH BRACKET
P/N: 2065
DOOR SENSOR BRACKET
P/N: CRSS10035

NOT SHOWN:

LEFT & RIGHT LOADCELL
BRACKET ASSEMBLY
P/N: 10059L & 10059R
SEE ASSEMBLY ILLUSTRATION

ATTACHED TO TONG WITH:
5/8"-11 x 2 1/4" HHCS
P/N: 201
5/8" LOCKWASHER
P/N: 1151
(12) REQD. OF EACH

TOP VIEW ASSEMBLY

SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

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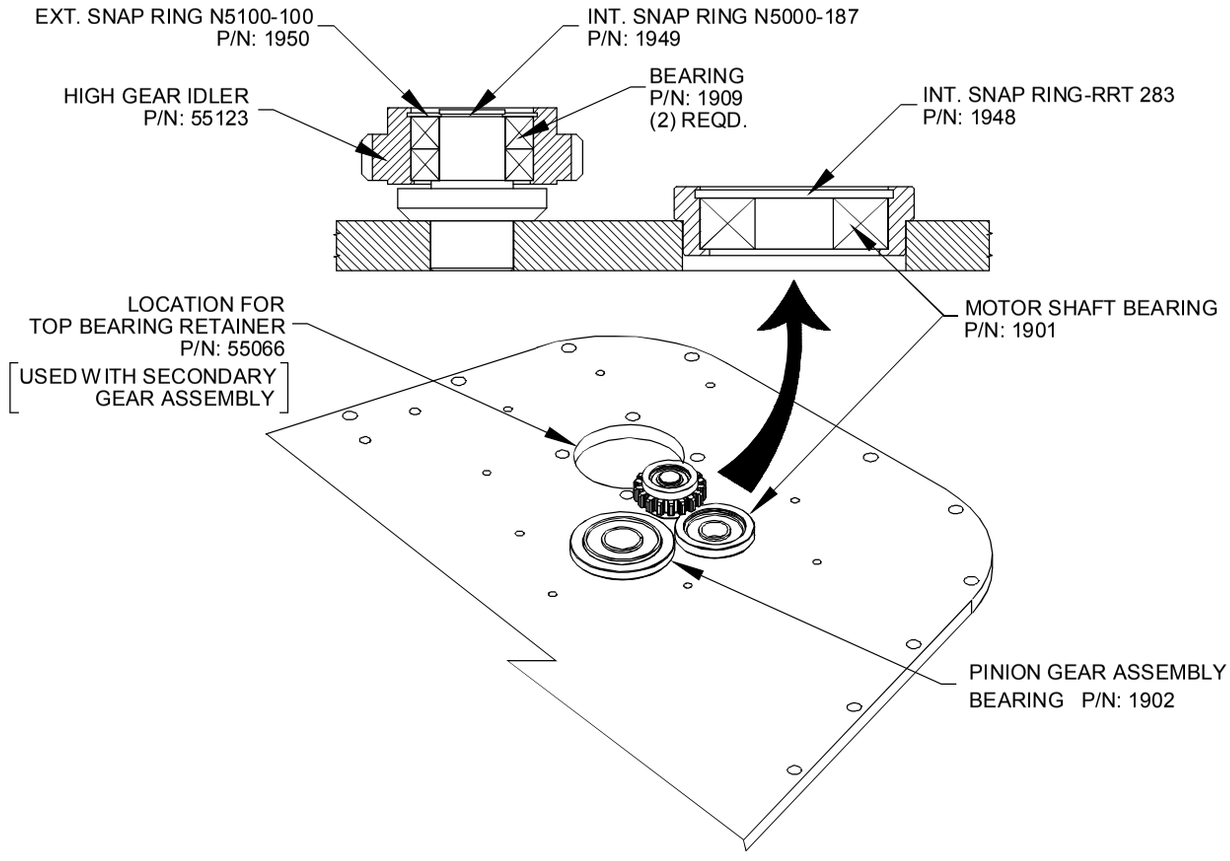

TOP PLATE ASSEMBLY

SHOWN WITHOUT LOW GEAR HOUSING

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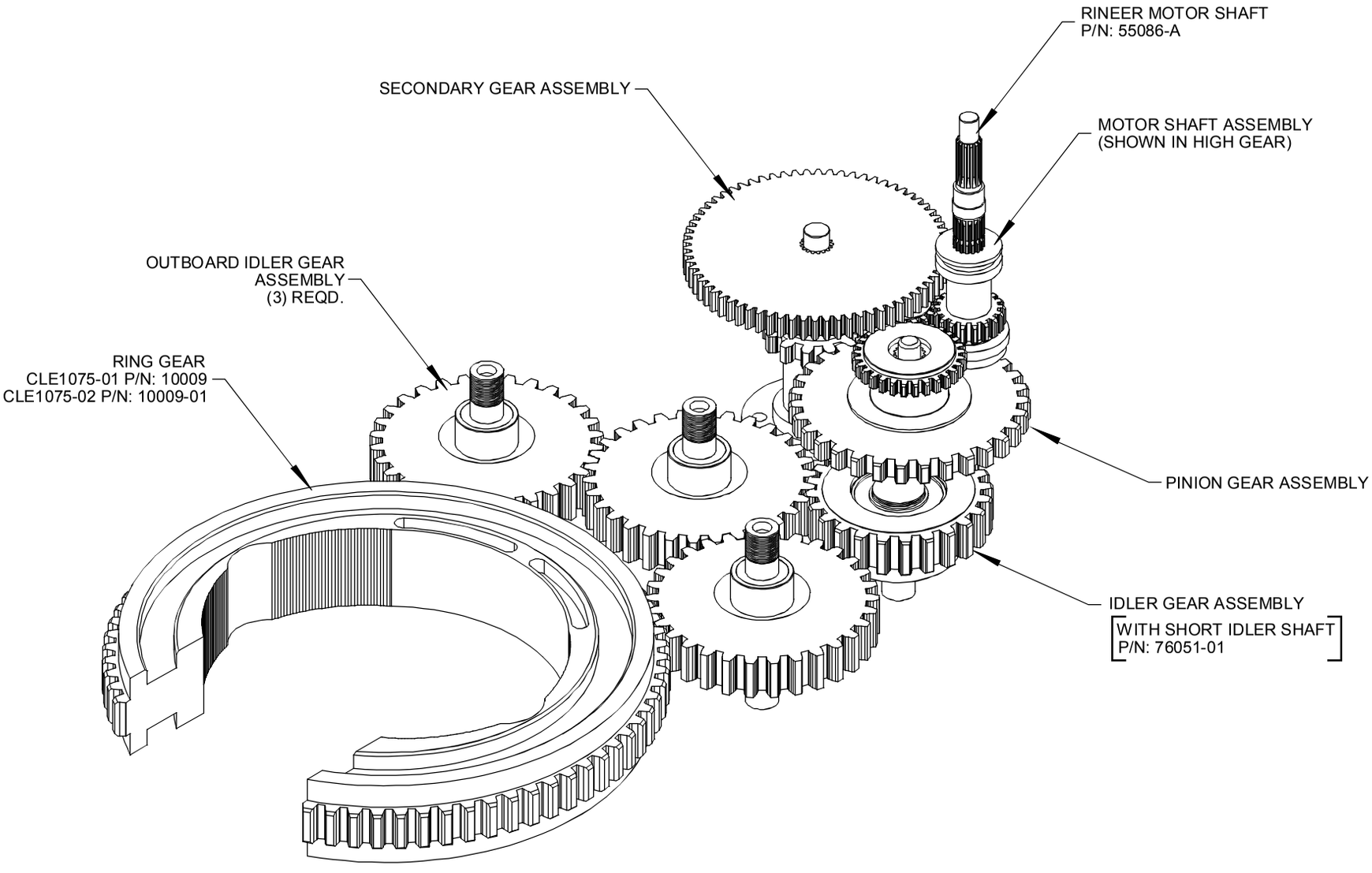

10 3/4" TONG GEAR TRAIN

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4225 HWY. 90 EAST
BROUSSARD, LA 70518
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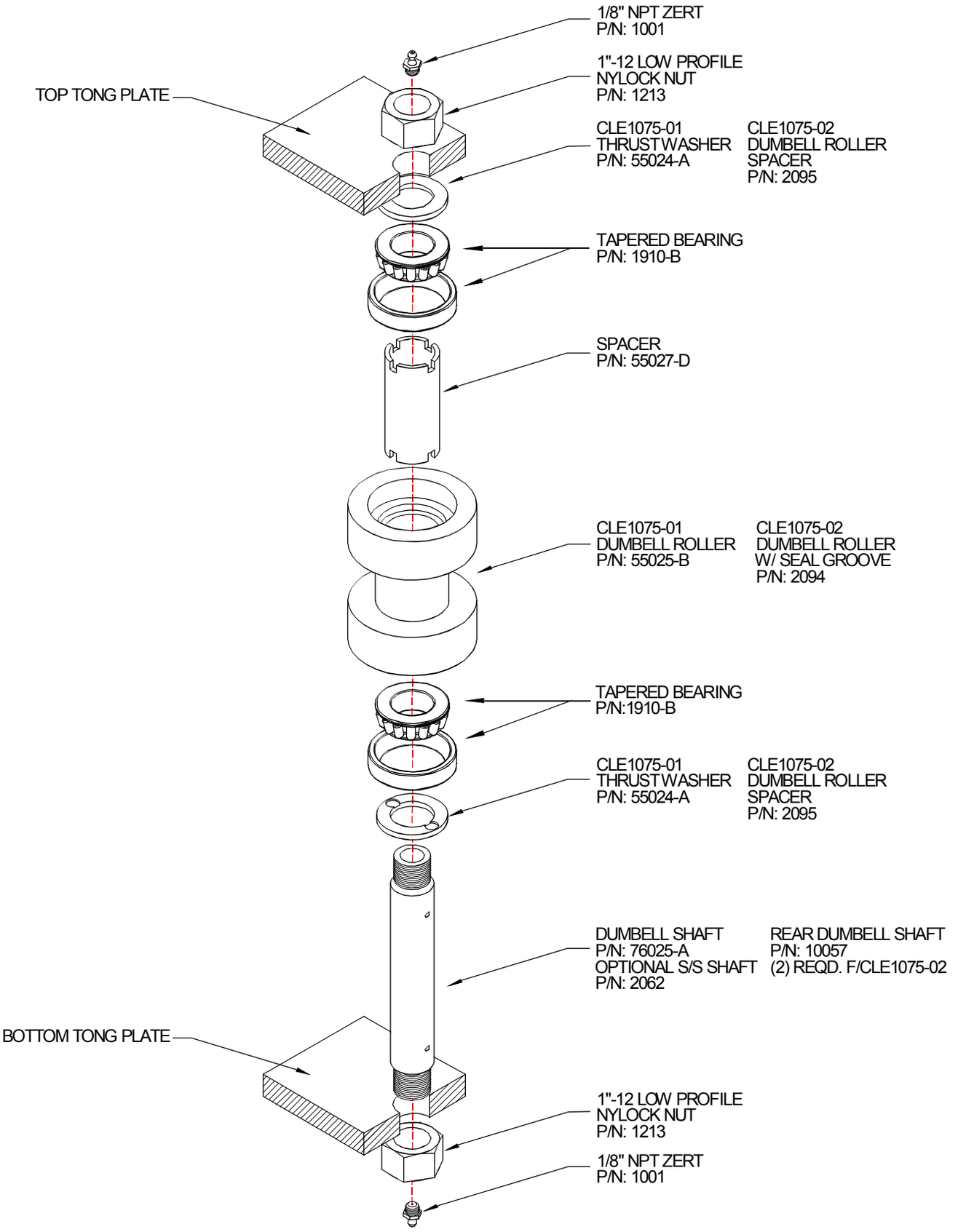
		11/18/02

REF: S:\Equip Manuals\Dwgs\CLE1075\Gear Train.wpg



DUMBELL ROLLER ASSEMBLY

SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

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		11/18/02
REV. #	LOG #	DATE

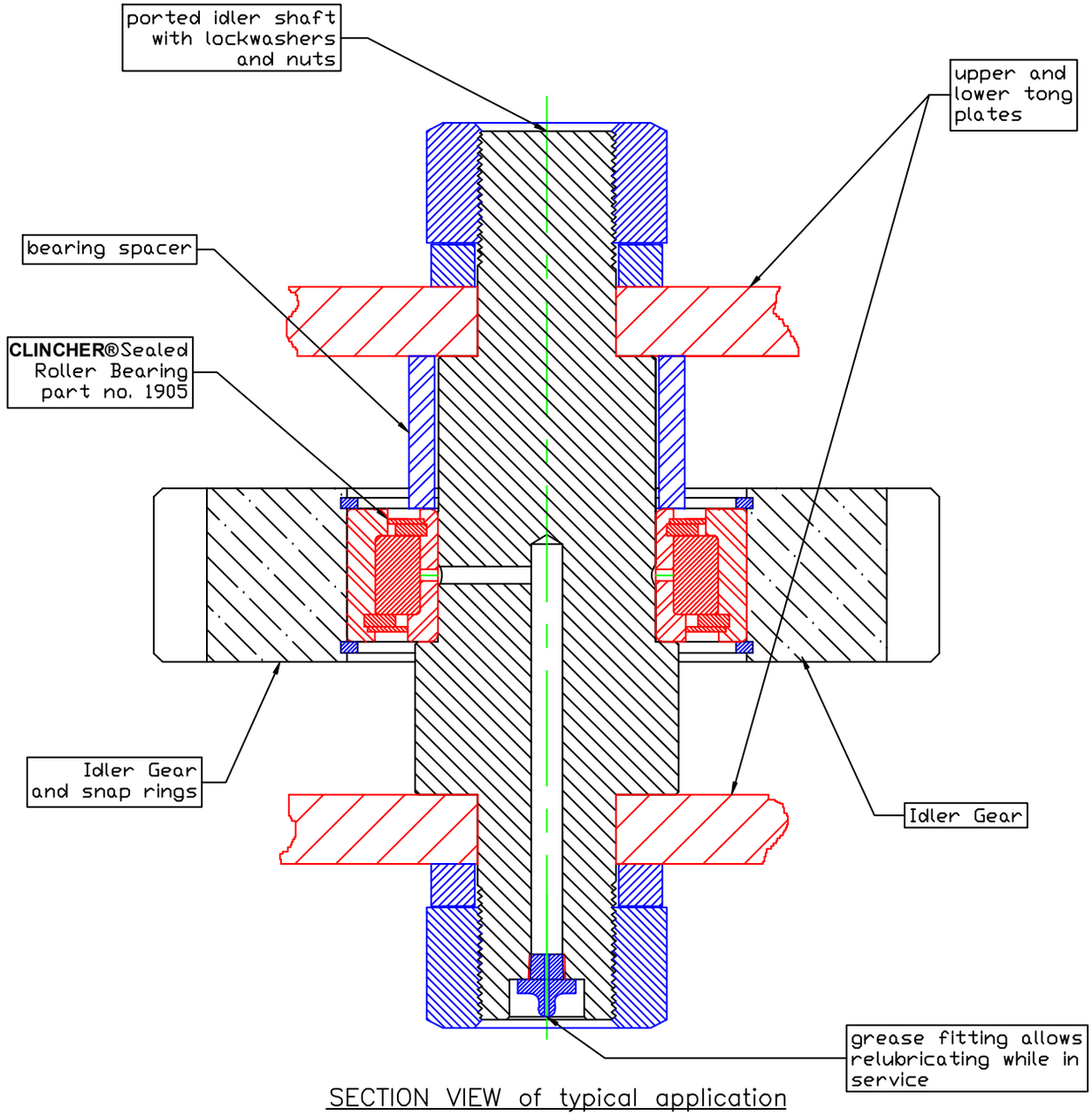
REF: S:\Equip Manuals-Dwgs\CLE1075\Dumbell Roller.wpg

Features and Benefits:
Proprietary sealed bearing with full compliment roller design offers greater load ratings than commercially available sealed ball bearings. The ported inner race allows the bearing to be relubricated without disassembly. Integral elastomeric seals allow grease to be displaced but prevent migration of contaiminants into bearing.

Elastomeric seals are corrosion resistant and suitable for use in environments which are incompatible with traditional aluminum bearing shrouds.

Unique geometric design allows rollers to absorb thrust loads to maximize component life.

Nominal OD: 4.3307 inches
Nominal ID: 2.3622 inches
Nominal Ht: 1.4375 inches
static rating: 37540 lbs
dynaminc rating: 29230 lbs
(1mm cycles, 33 1/3 RPM f/ 500 hrs.)


ported idler shaft with lockwashers and nuts
upper and lower tong plates
bearing spacer
CLINCHER® Sealed Roller Bearing part no. 1905
Idler Gear and snap rings
Idler Gear
grease fitting allows relubricating while in service

SECTION VIEW of typical application

Rev.#	By	Log#	Description of Revision
3			
2			
1	DB	12/07/02	added desc of thrust load capability

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UNLESS OTHERWISE SPECIFIED TOLERANCES ARE — R3

2 PLACE DEC. ±.020	3 PLACE DEC. ±.005	FRACTIONS ± 1/16	ANGLES ± .5°	SURFACE 250	FLATNESS AR PL. ± .015 per foot

1. Dimensions are in inches
2. Remove burrs & sharp edges with 1/64x45°max.
3. Machined fillet radii are 1/32
4. Normality,Squareness & parallelism of machine surfaces are .002 per inch, to a max of .012 inches for a single surface.
5. Machine diameters on a common centerline must be concentric within .005 T.I.R & unmachined diameters concentric within .032 T.I.R

1 or (1) = Revision Number

1.000 = Critical Dimension 100% Inspection Required

SHEET 1 of 2

SUPERIOR Manufacturing & Hydraulics
4225 HWY.90 E
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(318)837-8847

PART NAME: SEALED IDLER BEARING

PART #: 1905

DRAWN BY:

APPROVED BY:

CHK BY: DATE:

REF: REF ILL1000/ILL1142.DWG

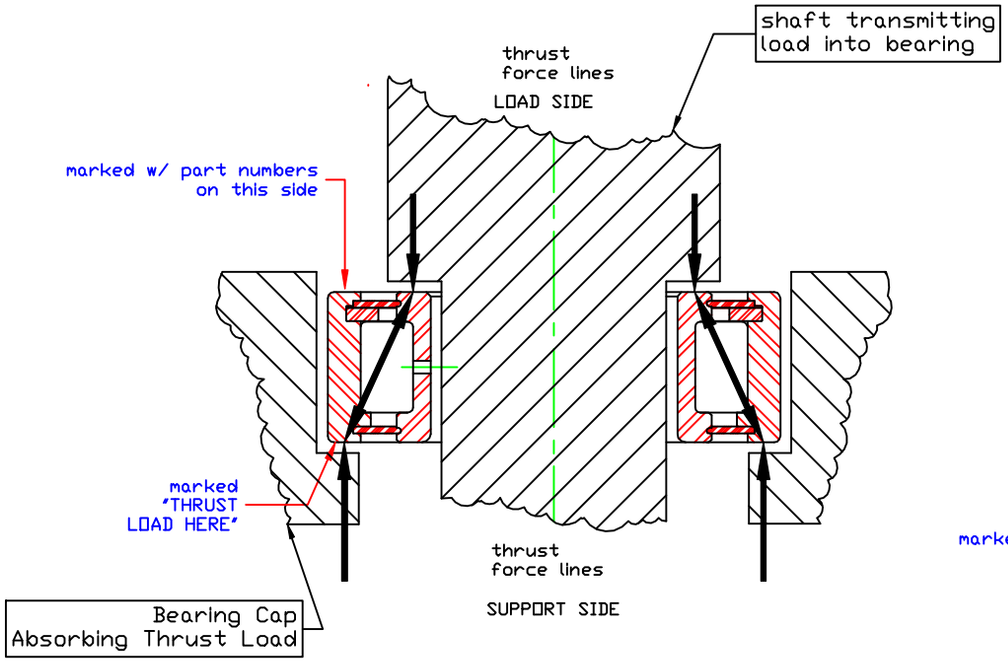
MATERIAL SPECIFICATION

Matl.Req:

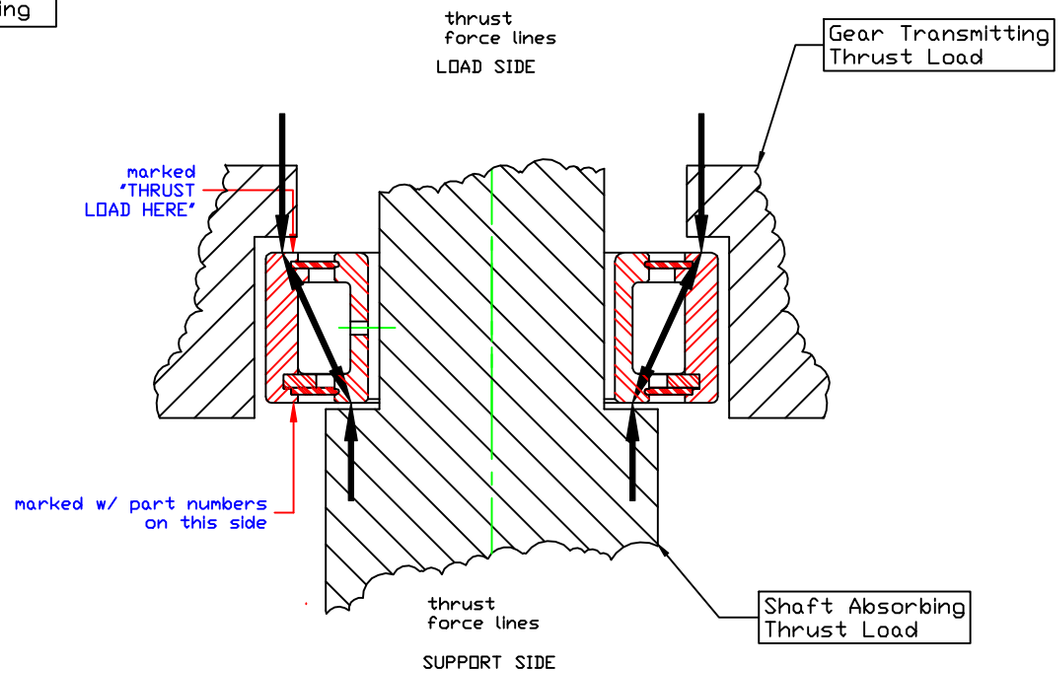
Initial Condition:

Alternative Matl:

H.T Instructions: Case Depth: C.D



Bottom Bearing Cap Application



Gear Support Application

Installation instructions for **CLINCHER®** BEARING Part Number 1905

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE					R3
2 PLACE DEC. ±.020	3 PLACE DEC. ±.005	FRACTIONS ± 1/16	ANGLES ± .5'	SURFACE 250	FLATNESS AR PL. ± .015 per foot

1. Dimensions are in inches
2. Remove burrs & sharp edges with 1/64x45°max.
3. Machined fillet radii are 1/32
4. Normality,Squareness & parallelism of machine surfaces are .002 per inch, to a max of .012 inches for a single surface.
5. Machine diameters on a common centerline must be concentric within .005 T.I.R & unmachined diameters concentric within .032 T.I.R

Rev.#	By	Log#	Description of Revision
3			
2			
1	DB	12/07/02	added desc of thrust load capability

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△1 or ⬡1 = Revision Number

1.000 = Critical Dimension 100% Inspection Required

SHEET 2 of 2

SUPERIOR Manufacturing & Hydraulics
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BROUSSARD,LA 70518
(318)837-8847

PART NAME: Installation instructions for P/N 1905 SEALED IDLER BEARING

PART #: 1905

DRAWN BY:

APPROVED BY:

CHK BY: DATE:

REF: REF ILL1000/ILL1142.DWG

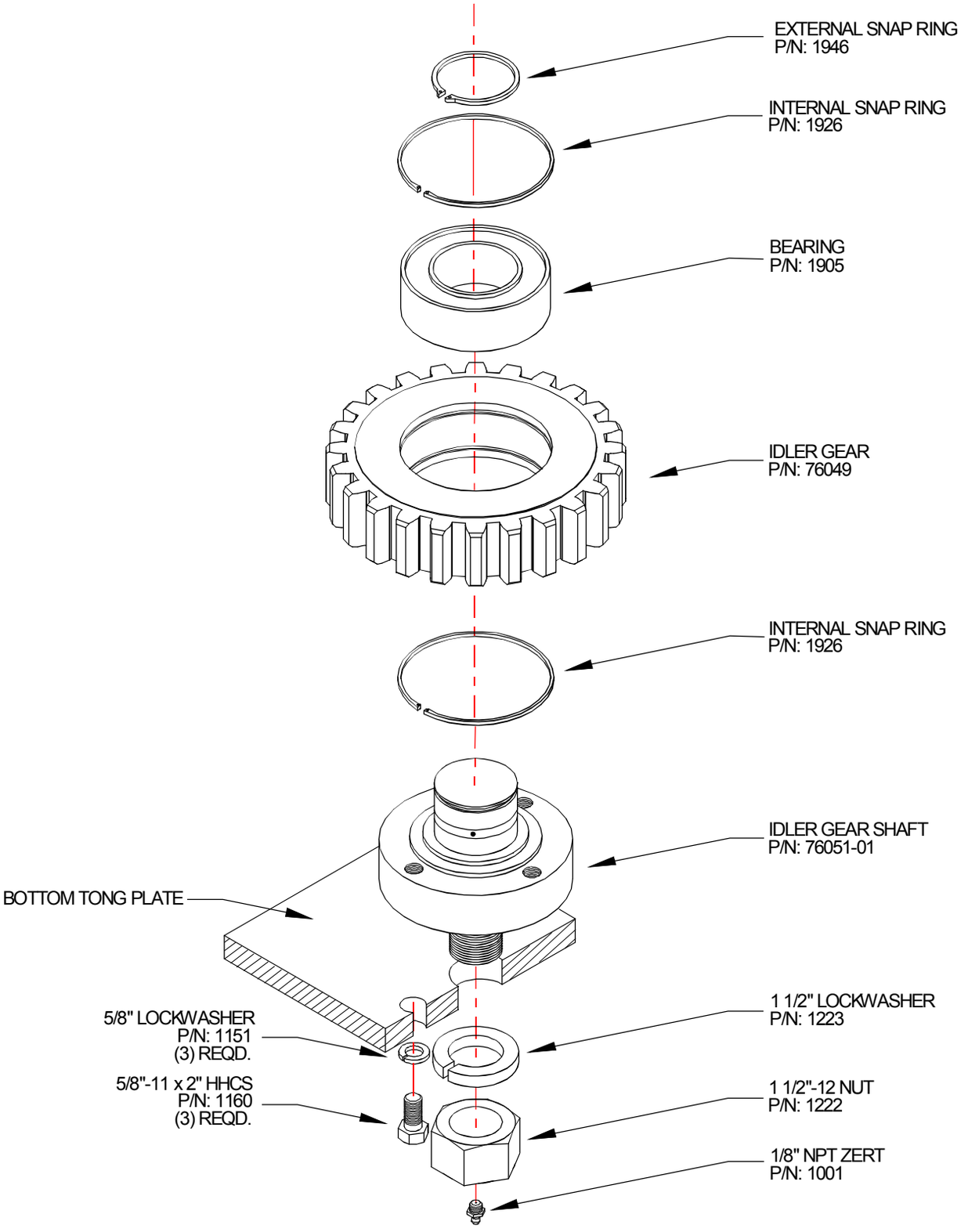
MATERIAL SPECIFICATION

Matl.Req:

Initial Condition:

Alternative Matl:

H.T Instructions: Case Depth: C.D



IDLER GEAR ASSEMBLY

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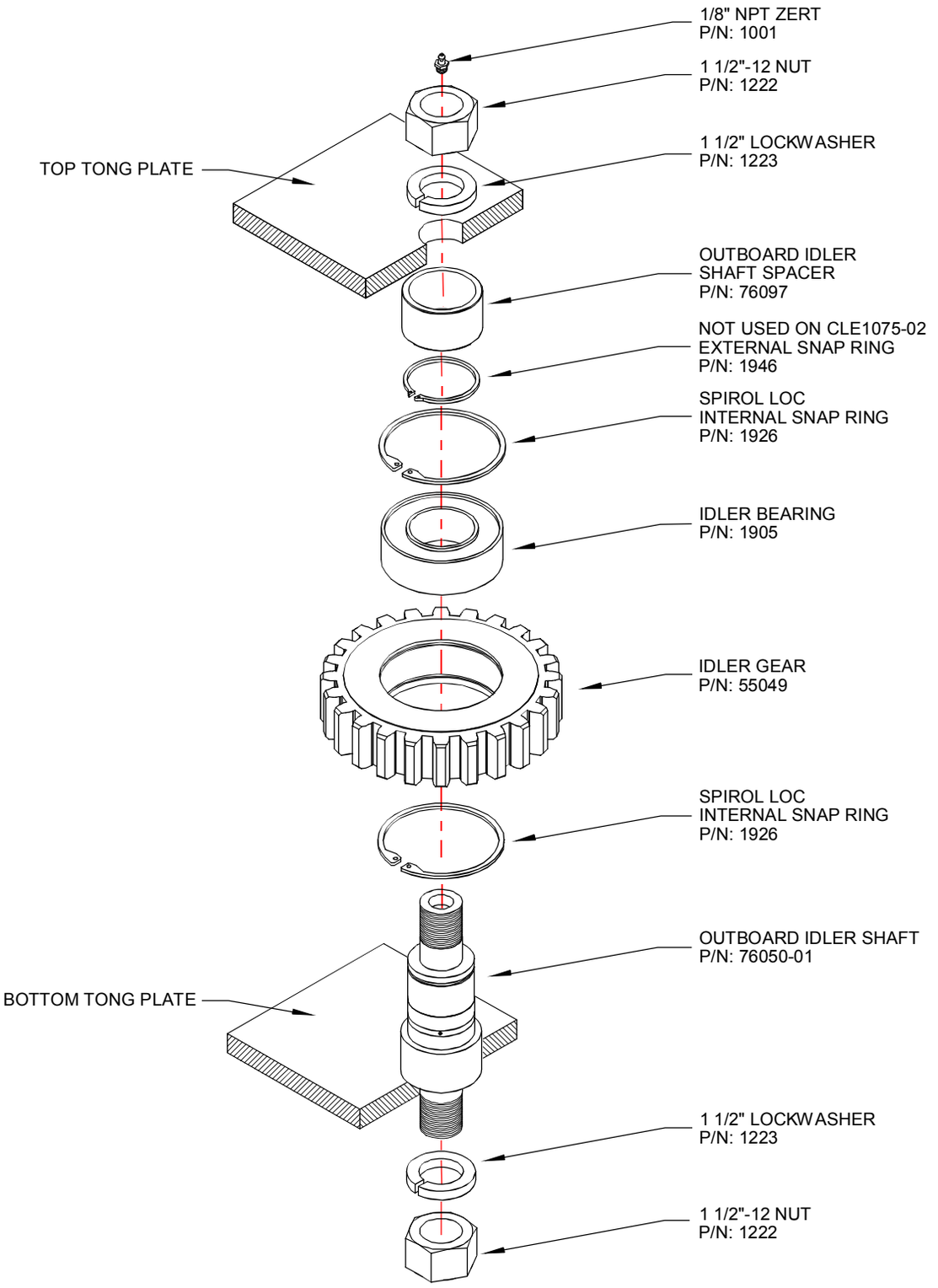
		11/18/02
REV. #	LOG #	DATE

REF: S:\Equip Manuals-Dwgs\CLE1075\Idler Gear.wpg



OUTBOARD IDLER GEAR ASSEMBLY

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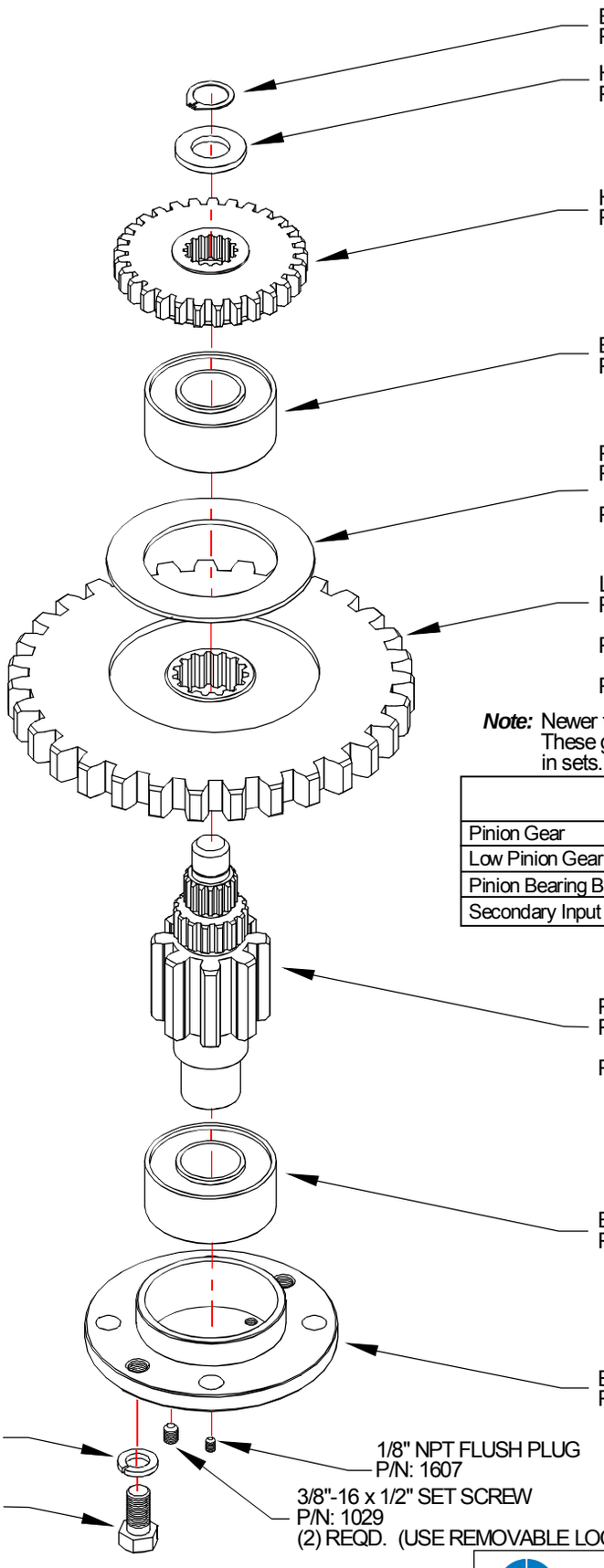
		08/21/03
REV. #	LOG #	DATE

REF: S:\Equip Manuals-Dwgs\CLE1075\Outboard Idler rev1.wpg



Note: Newer tongs utilize different pinion and low pinion gears. These gears are *NOT* interchangeable and must be used in sets.

	STANDARD OLD P/N	***ALTERNATE OLD P/N***	***NEW P/N***
Pinion Gear	55038-01	55038-01	73038
Low Pinion Gear	55047	55047BJ	55161BJ
Pinion Bearing Bushing	55047-1	55047-1	14049
Secondary Input Gear	55048	55048BJ	55048BJ

PINION GEAR ASSEMBLY

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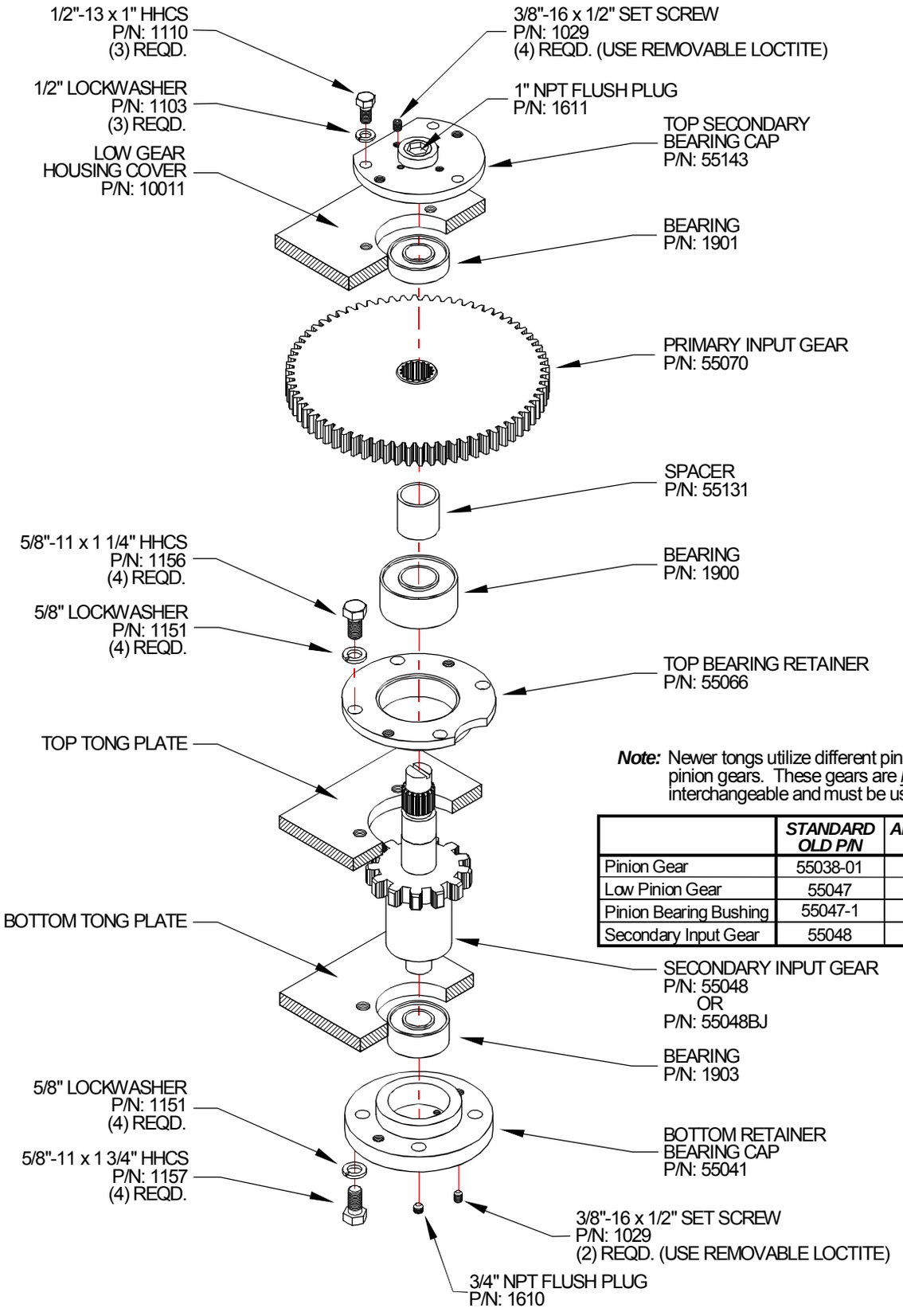
		11/18/02
REV. #	LOG #	DATE

REF: S:\Equip Manuals-Dwgs\CLE1075\Pinion Gear.wpg



Note: Newer tongs utilize different pinion and low pinion gears. These gears are *NOT* interchangeable and must be used in sets.

	STANDARD OLD P/N	***ALTERNATE P/N***
Pinion Gear	55038-01	55038-01
Low Pinion Gear	55047	55047BJ
Pinion Bearing Bushing	55047-1	55047-1
Secondary Input Gear	55048	55048BJ

SECONDARY GEAR ASSEMBLY

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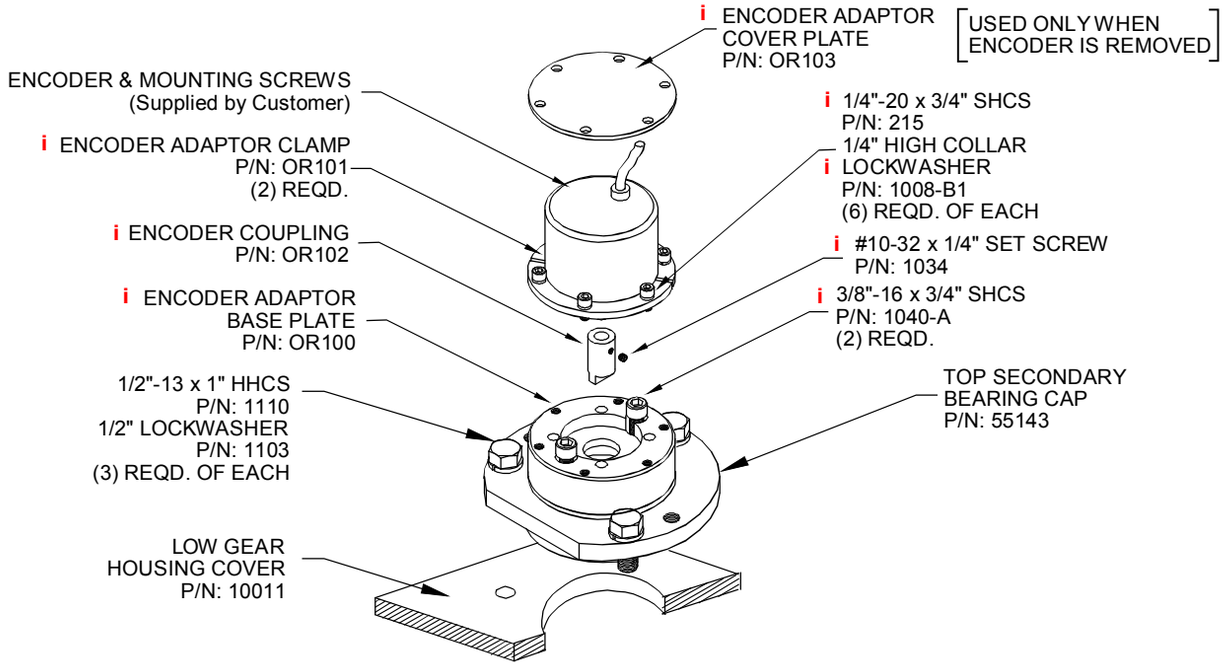
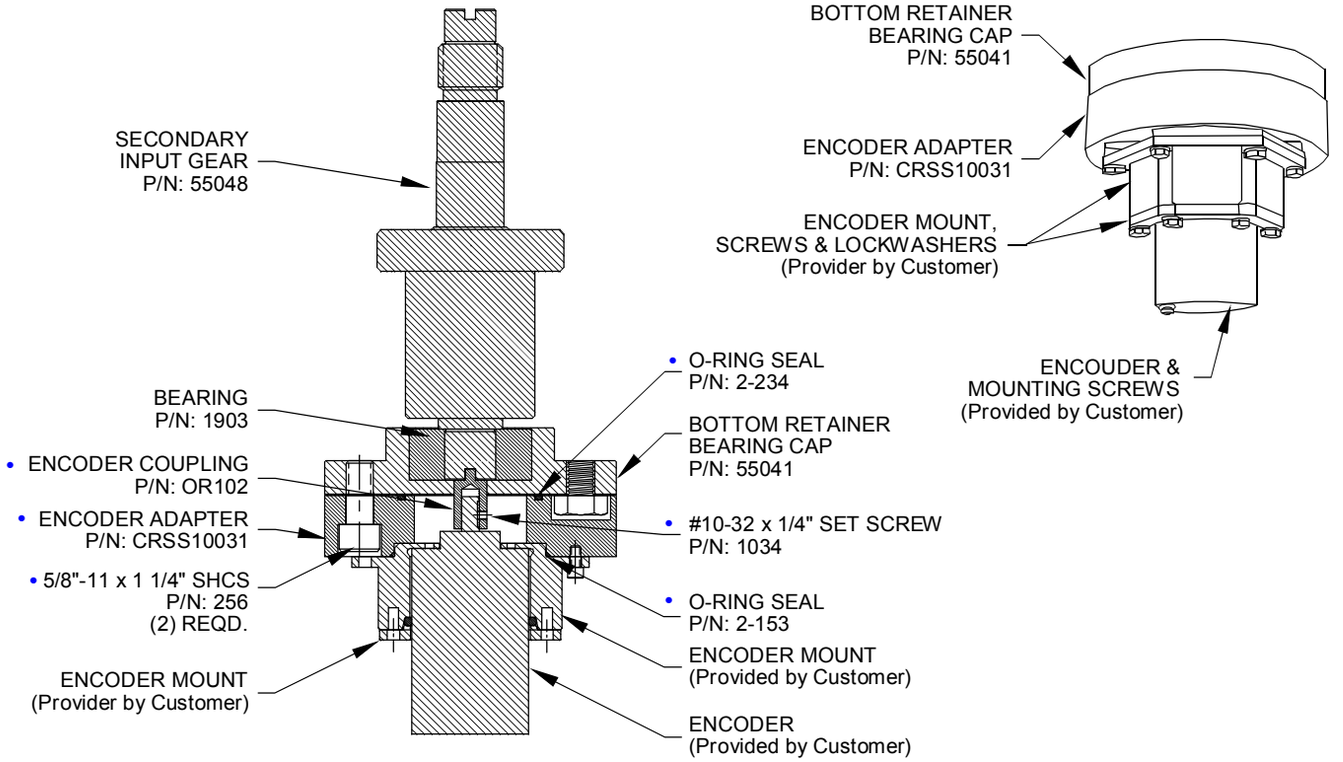
		11/18/02
REV. #	LOG #	DATE

REF: S:\Equip Manuals-Dwgs\CLE1075\Secondary Gear.wpg


i ENCODER ADAPTOR COVER PLATE P/N: OR103
USED ONLY WHEN ENCODER IS REMOVED
ENCODER & MOUNTING SCREWS (Supplied by Customer)
i ENCODER ADAPTOR CLAMP P/N: OR101 (2) REQD.
i ENCODER COUPLING P/N: OR102
i ENCODER ADAPTOR BASE PLATE P/N: OR100
1/2"-13 x 1" HHCS P/N: 1110
1/2" LOCKWASHER P/N: 1103
(3) REQD. OF EACH
LOW GEAR HOUSING COVER P/N: 10011
i 1/4"-20 x 3/4" SHCS P/N: 215
1/4" HIGH COLLAR
i LOCKWASHER P/N: 1008-B1
(6) REQD. OF EACH
i #10-32 x 1/4" SET SCREW P/N: 1034
i 3/8"-16 x 3/4" SHCS P/N: 1040-A
(2) REQD.
TOP SECONDARY BEARING CAP P/N: 55143

TOP ENCODER ASSEMBLY

ENCODER ASSEMBLY NO. OR1000 i


BOTTOM RETAINER BEARING CAP P/N: 55041
ENCODER ADAPTER P/N: CRSS10031
ENCODER MOUNT, SCREWS & LOCKWASHERS (Provider by Customer)
ENCOUDER & MOUNTING SCREWS (Provided by Customer)
SECONDARY INPUT GEAR P/N: 55048
• O-RING SEAL P/N: 2-234
BEARING P/N: 1903
BOTTOM RETAINER BEARING CAP P/N: 55041
• ENCODER COUPLING P/N: OR102
• ENCODER ADAPTER P/N: CRSS10031
• #10-32 x 1/4" SET SCREW P/N: 1034
• 5/8"-11 x 1 1/4" SHCS P/N: 256 (2) REQD.
• O-RING SEAL P/N: 2-153
ENCODER MOUNT (Provided by Customer)
ENCODER MOUNT (Provider by Customer)
ENCODER (Provided by Customer)

BOTTOM ENCODER ASSEMBLY

COMPONENTS ON ENCODER ASSY. •

ENCODER ASSEMBLIES ON SECONDARY GEAR

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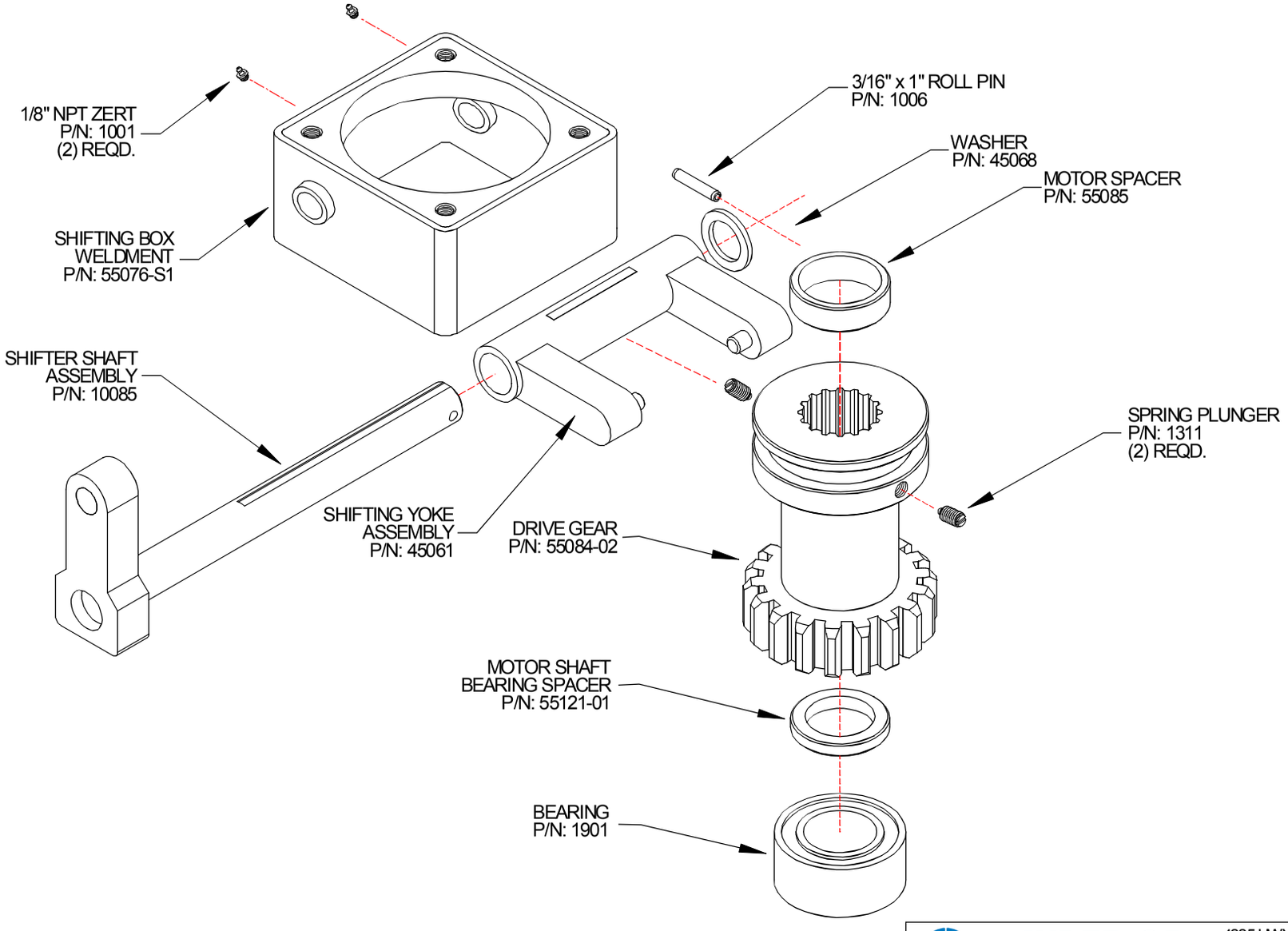
1		04/23/03
REV. #	LOG #	DATE

REF: S:\Equip Manuals-Dwgs\CLE1075-02\Encoders rev1.wpg



REMOTE SHIFT ASSEMBLY

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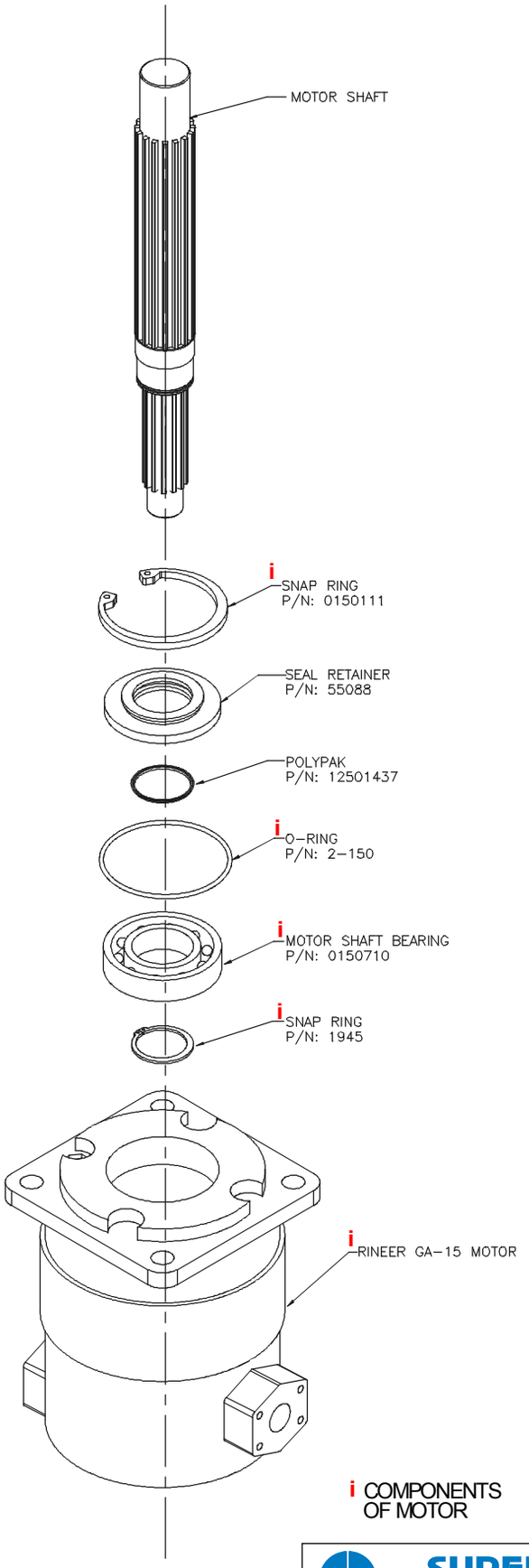
		11/19/02
REV. #	LOG #	DATE

REF: S:\Equip Manuals-Dwgs\CLE1075-02\Remote Shift.wpg



i COMPONENTS OF MOTOR

MOTOR ASSEMBLY

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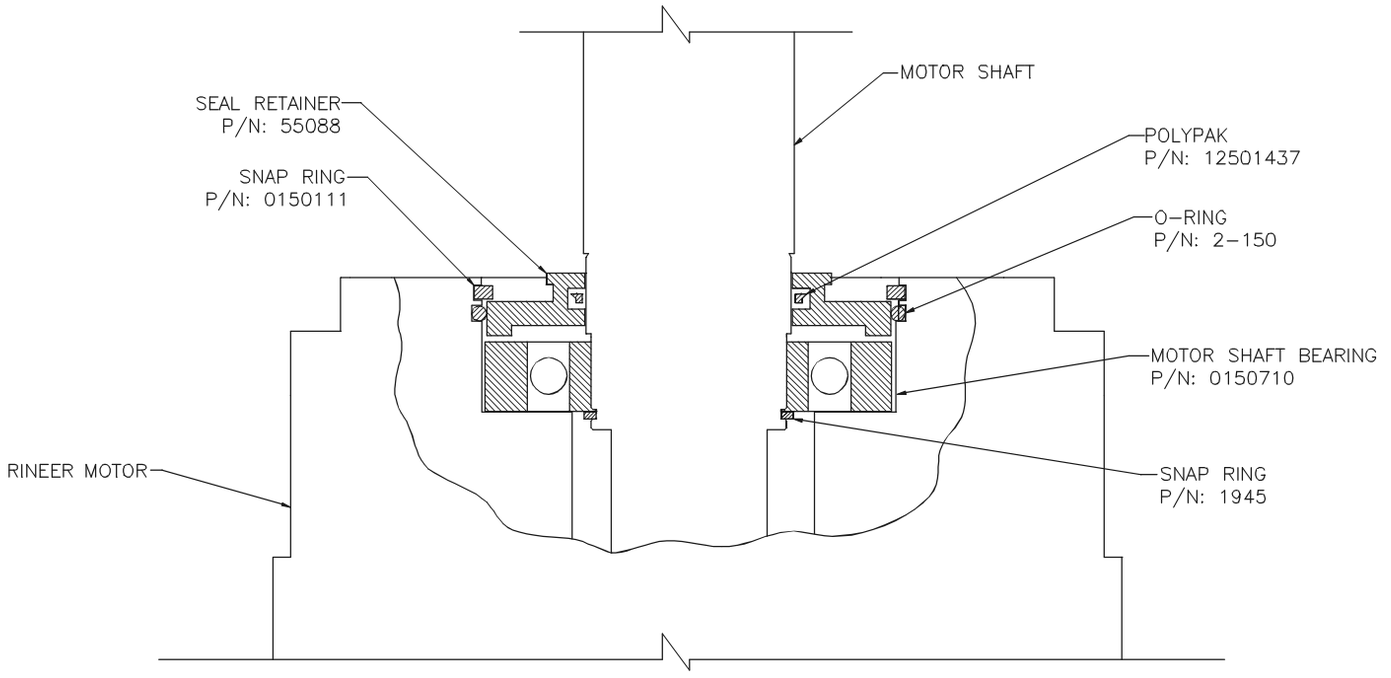
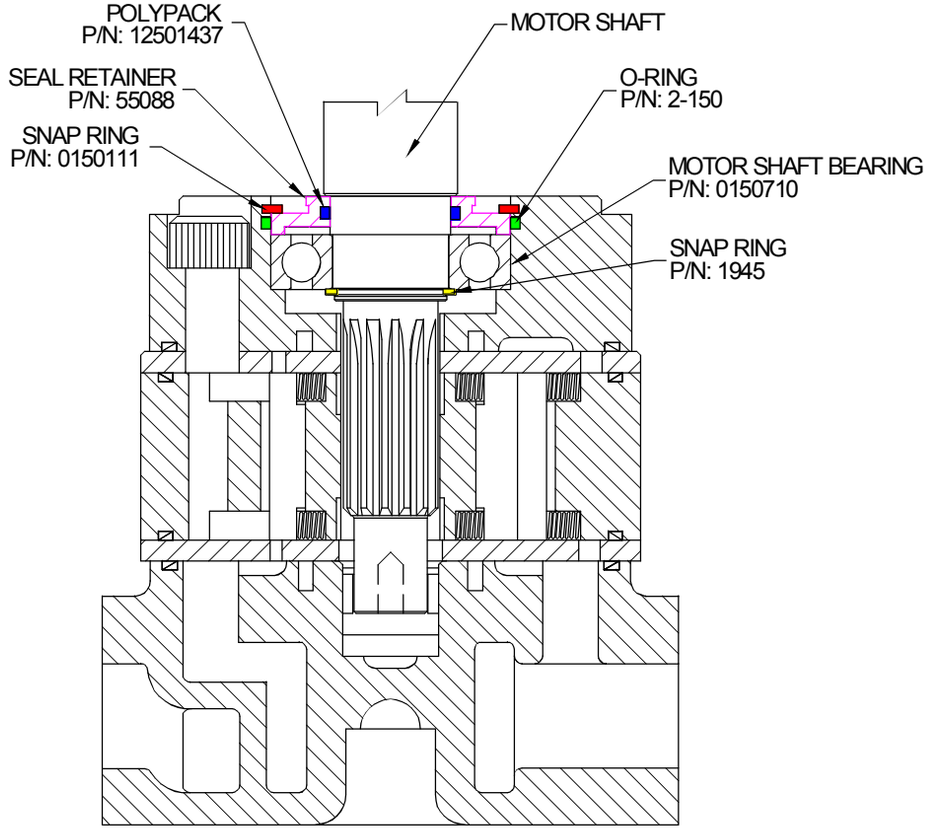
REV. #	LOG #	DATE
		06/07/02

REF: S:\Equip Manuals-Dwgs\Motor\Motor CLE5500+ sht1.wpg





W/ OUT WIPER RING

MOTOR ASSEMBLY

FOR CLARITY PURPOSE ONLY
NOT TO SCALE

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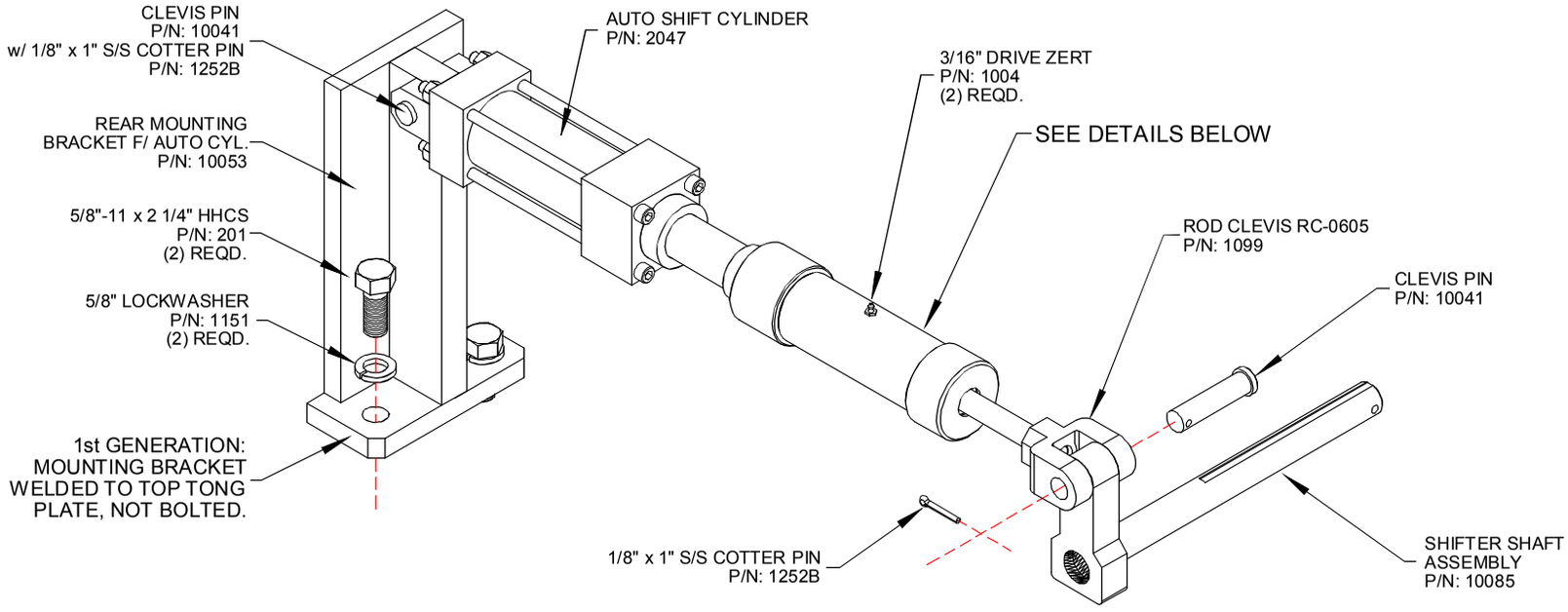
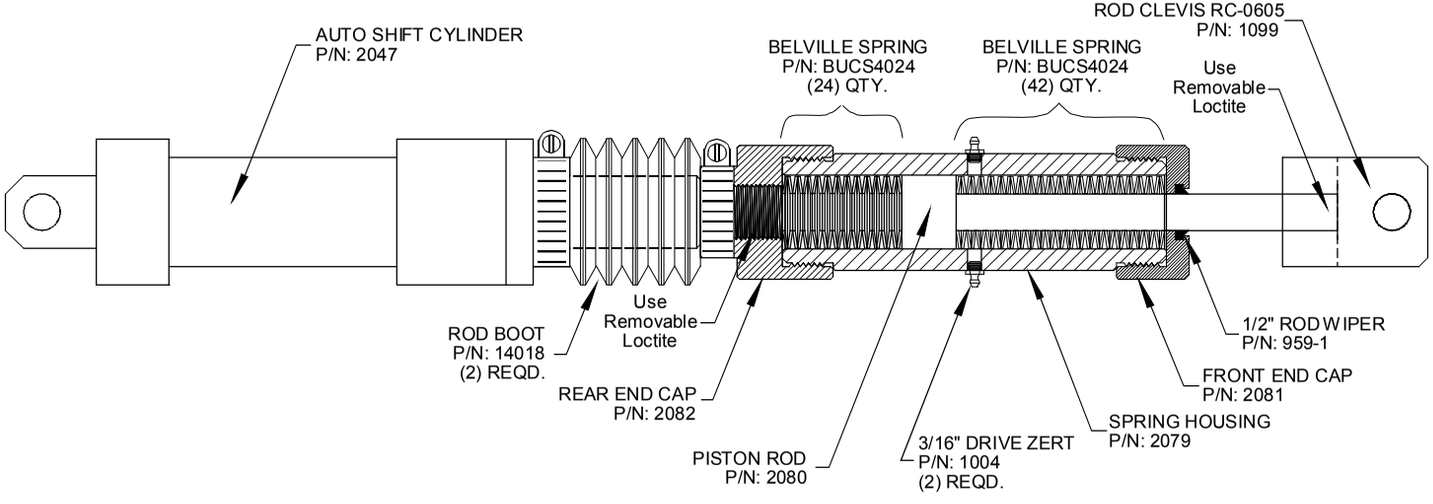
REV. #	LOG #	DATE
1		09/03/02

REF: S:\Equip Manuals-Dwgs\Motor\Motor CLE5500+ sht2 rev1.wpg





REMOTE SHIFT CYLINDER ASSEMBLY

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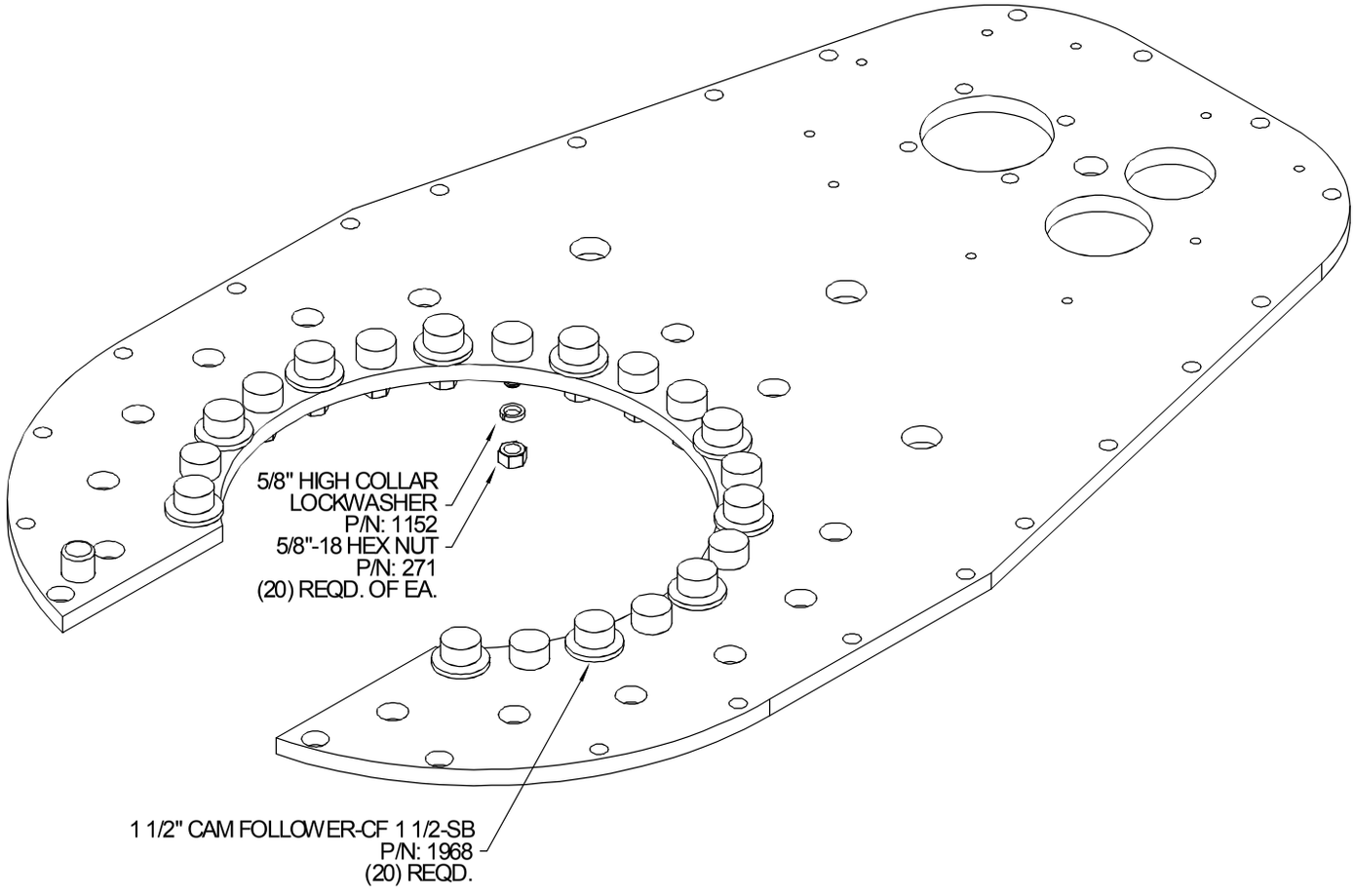
REV. #	LOG #	DATE
		11/26/02

REF: S:\Equip Manuals-Dwgs\CLE1075-02\Remote Shift Cyl.wpg



CAM FOLLOWER ASSEMBLY

TOP & BOTTOM PLATES ARE TYPICAL

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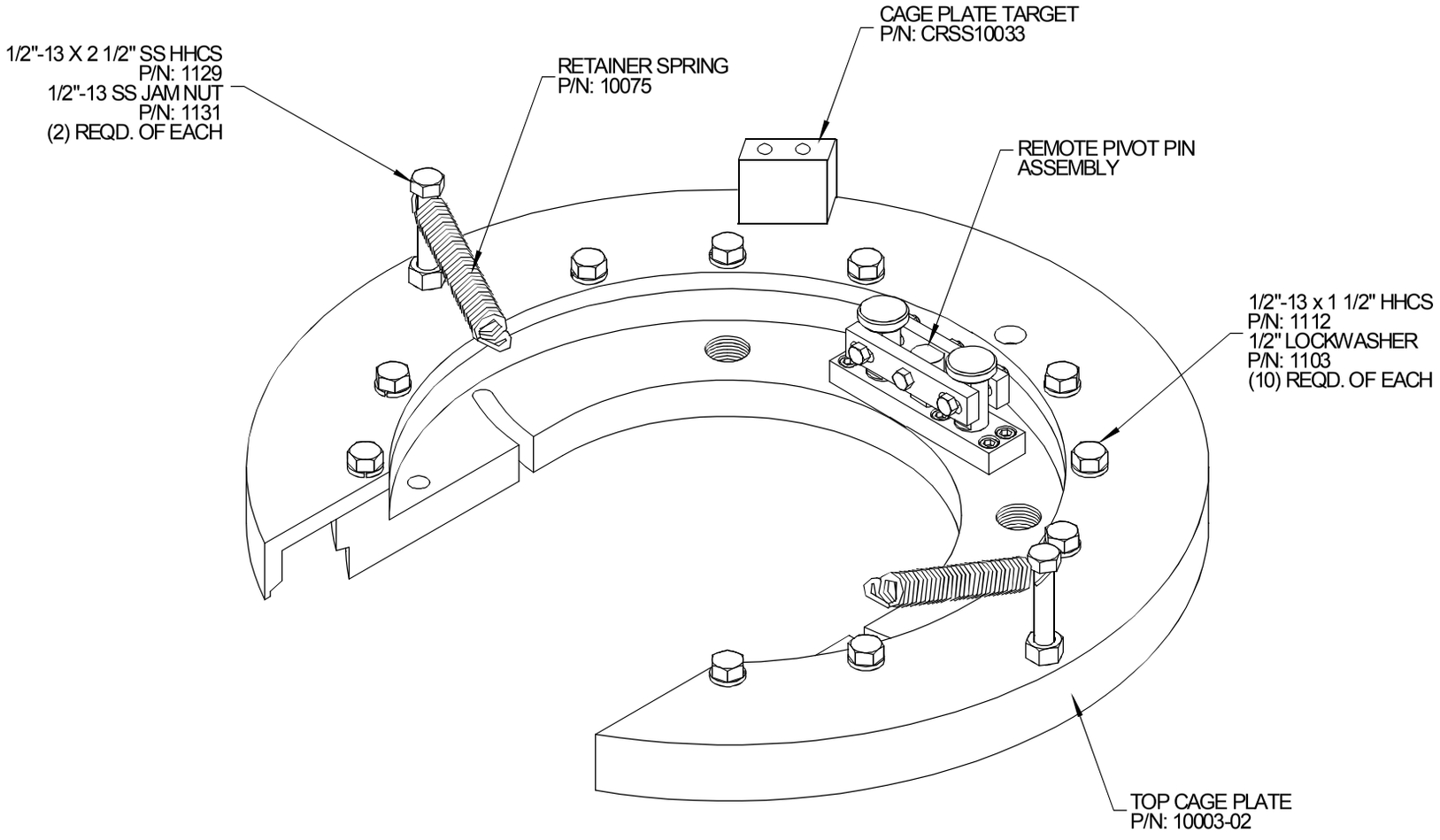
REV. #	LOG #	11/19/02 DATE

REF: S:\Equip Manuals\Dwgs\CLE1075-02\Cam Follower.wpg



TOP CAGE PLATE ASSEMBLY

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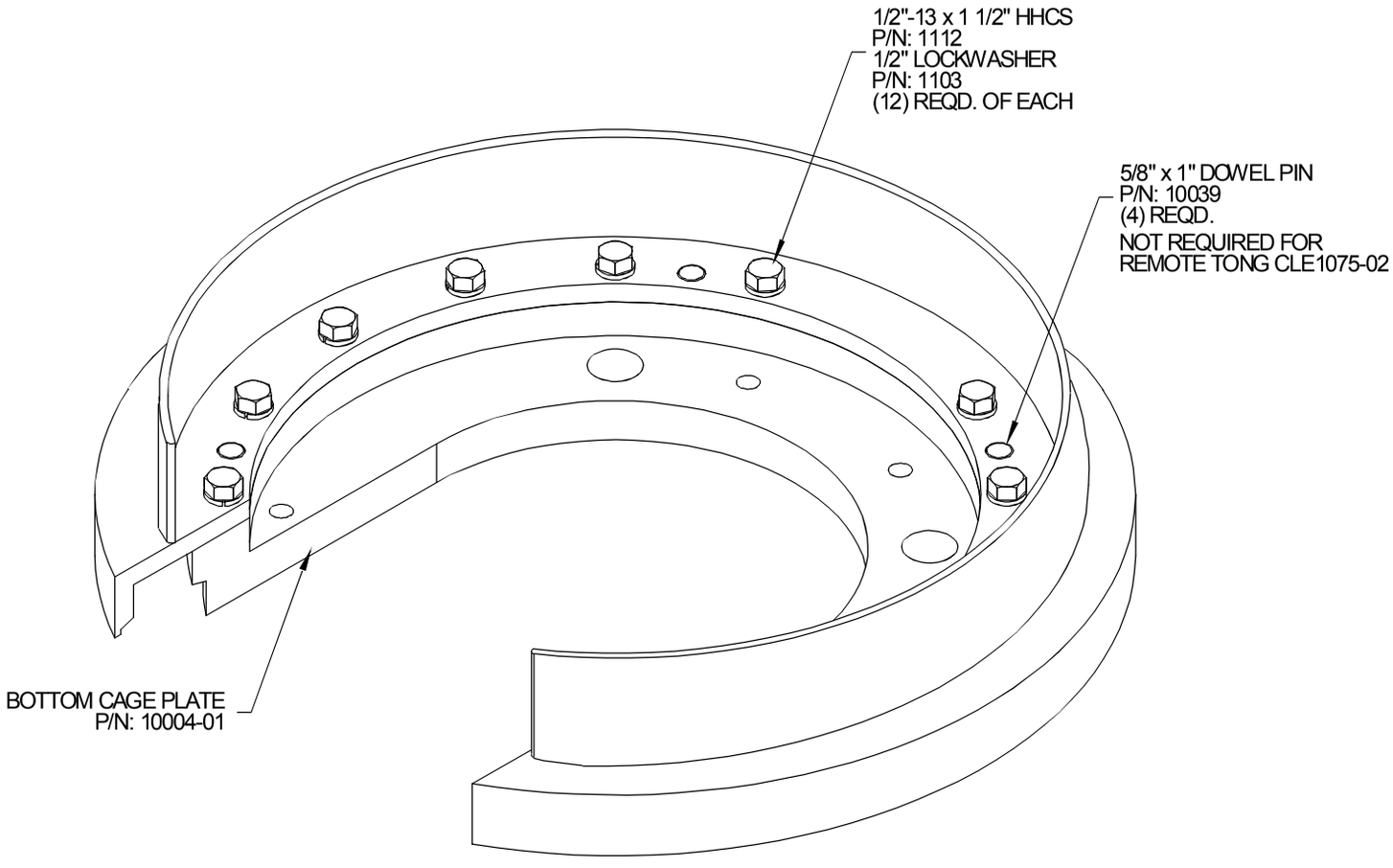
REV. #	LOG #	DATE
1		03/17/03

REF: S:\Equip Manuals\Dwgs\CLE1075-02\Cage Plate Top rev1.wpg



BOTTOM CAGE PLATE ASSEMBLY

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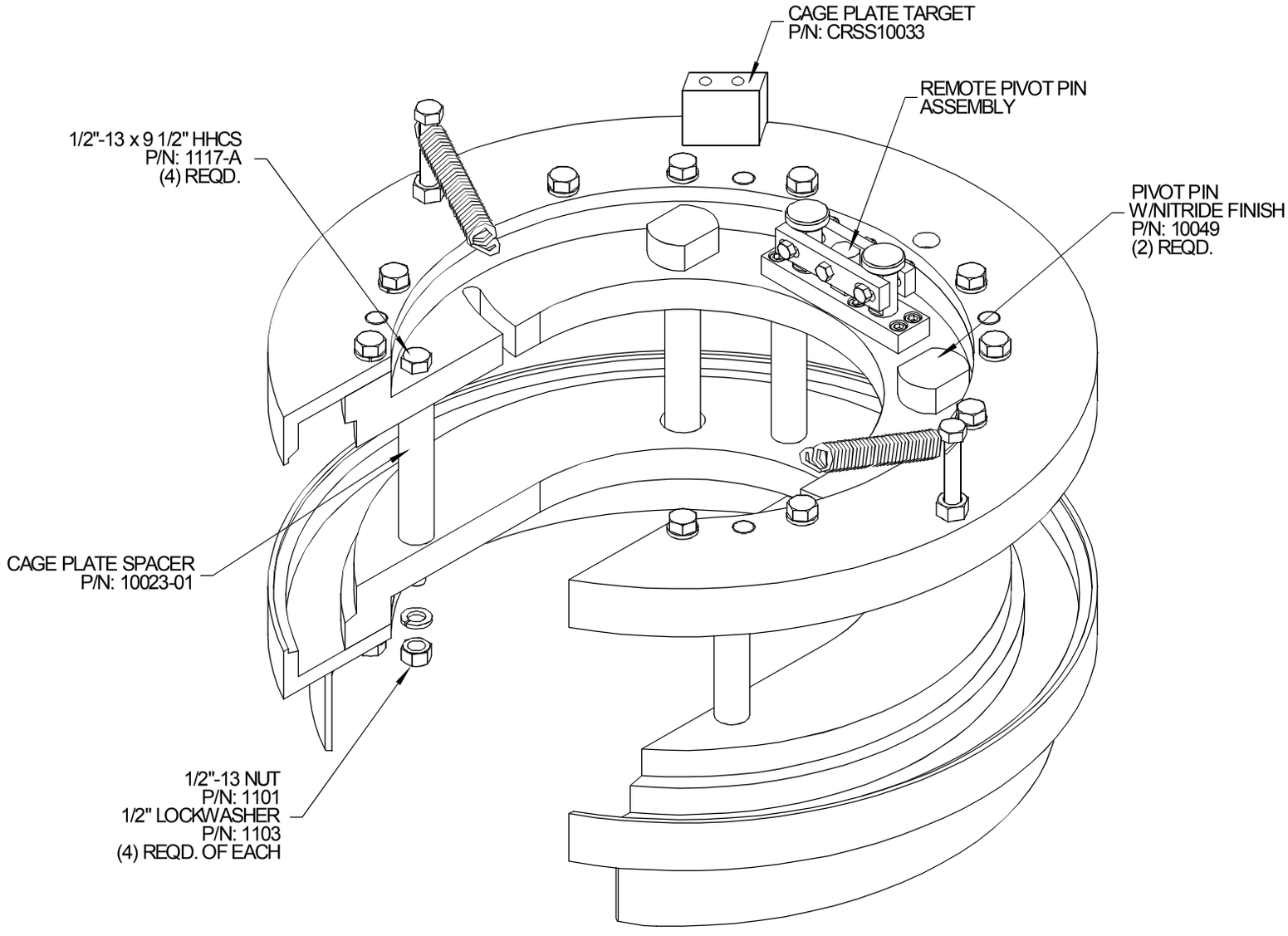
		03/17/03
REV. #	LOG #	DATE

REF: S:\Equip Manuals\Dwgs\CLE1075-02\Cage Plate Bottom.wpg



REMOTE CAGE PLATE ASSEMBLY

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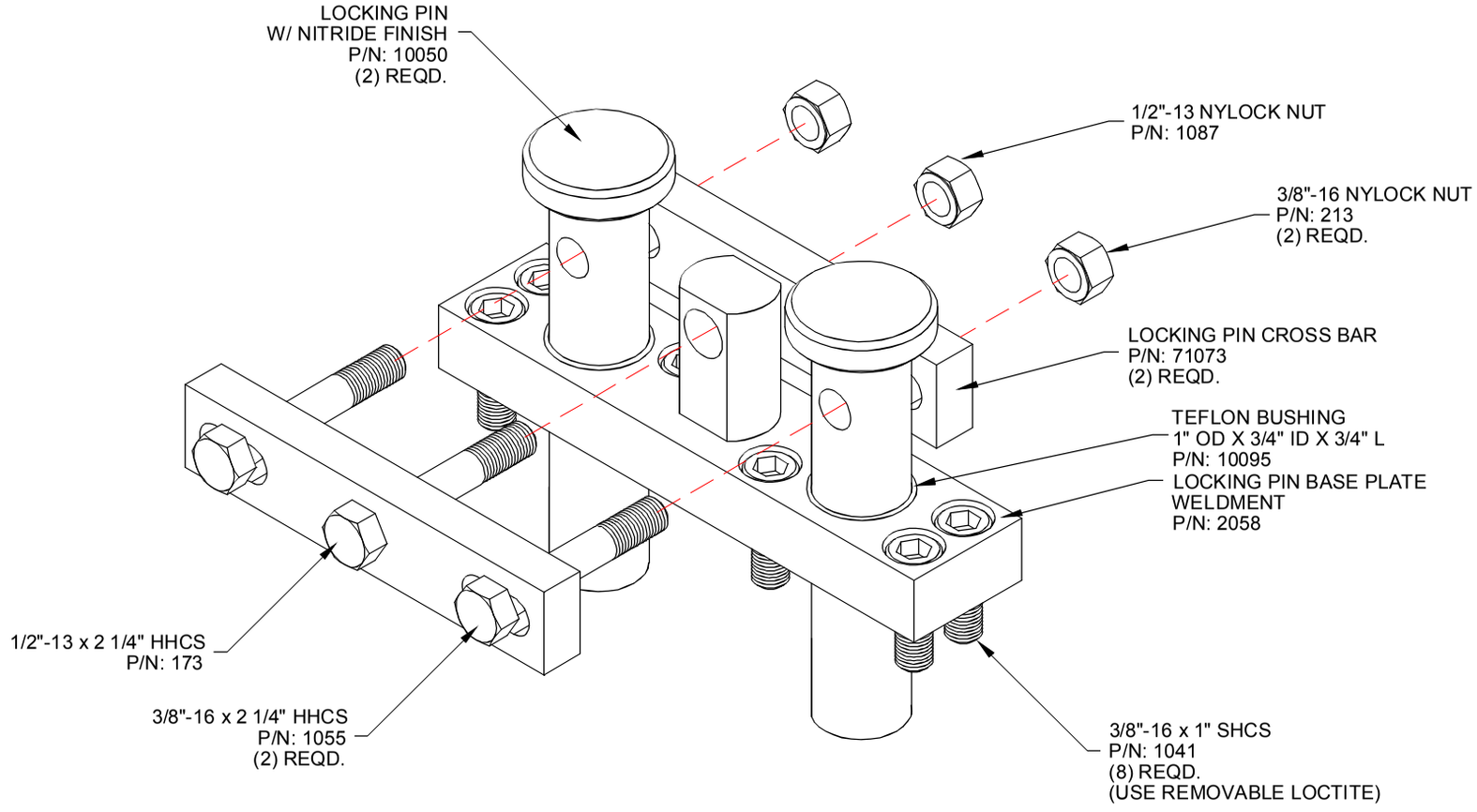
REV. #	LOG #	DATE
1		03/17/03

REF: S:\Equip Manuals\Dwgs\CLE1075-02\Remote Cage Plate rev1.wpg



REMOTE PIVOT PIN ASSEMBLY

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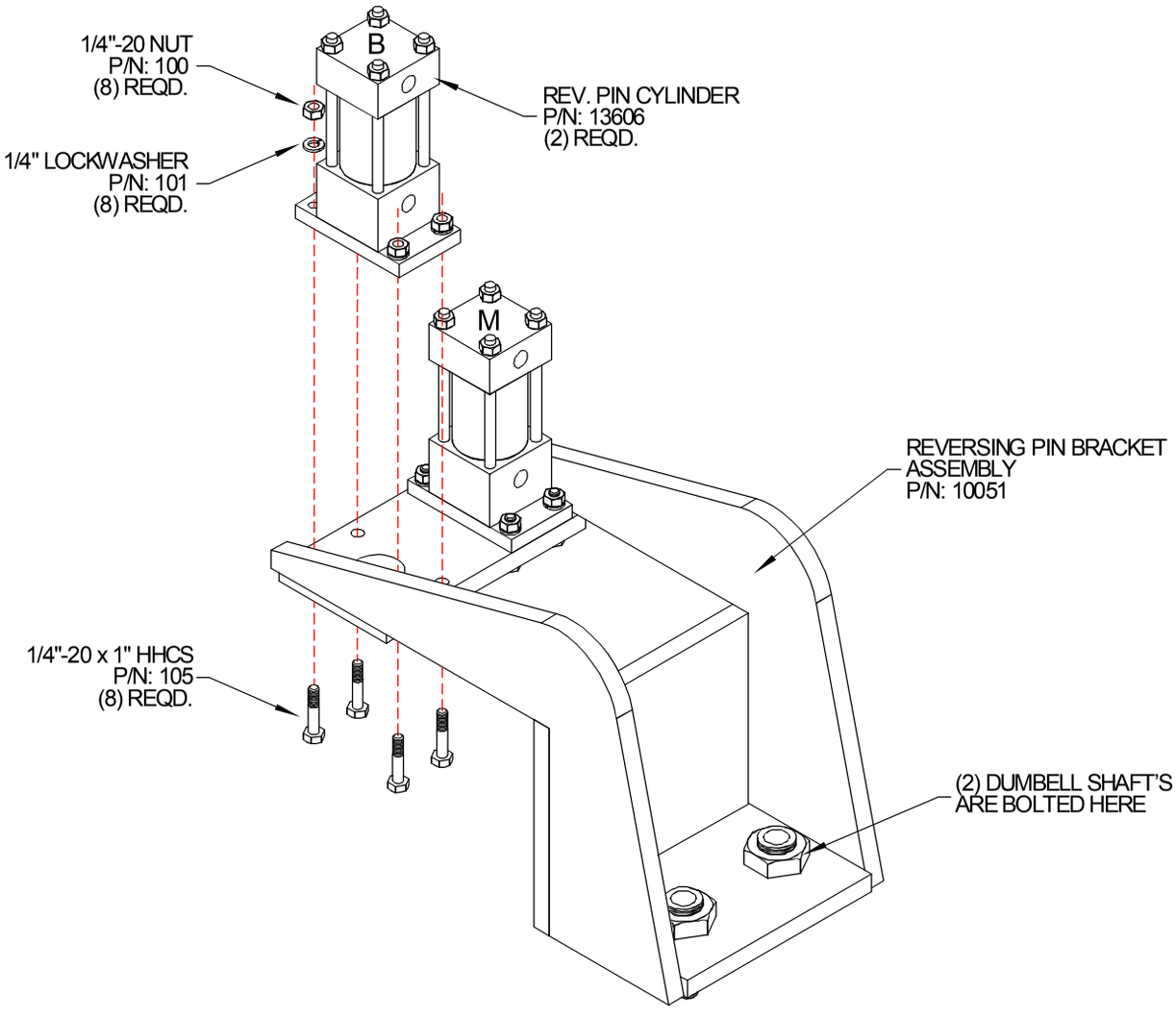
REV. #	LOG #	DATE
1		03/17/03

REF: S:\Equip Manuals\Dwgs\CLE1075-02\Remote Pivot Pin rev1.wpg



PIVOT PIN CYLINDER ASSEMBLY

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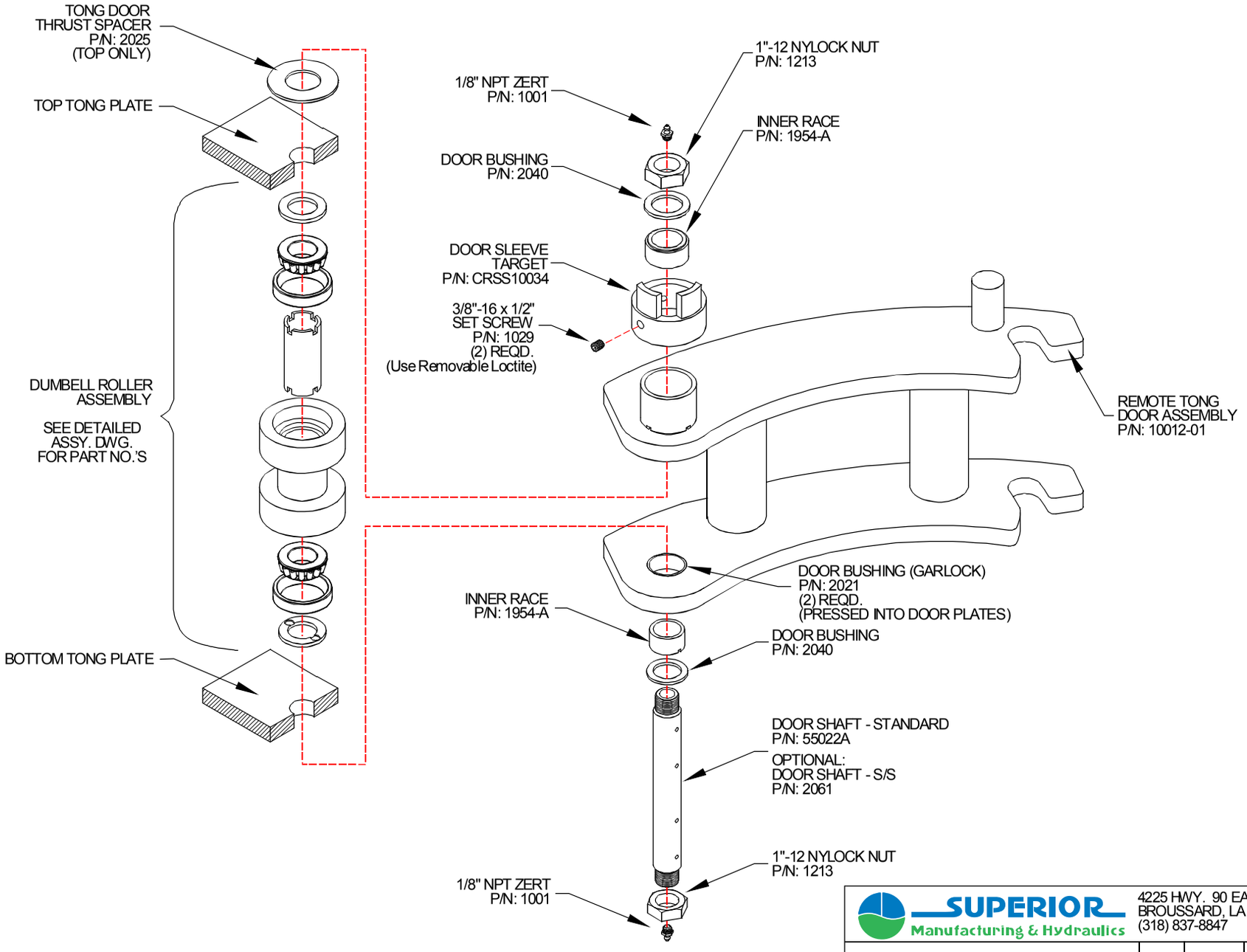
REV. #	LOG #	DATE
		11/20/02

REF: S:\Equip Manuals\Dwgs\CLE1075-02\Pivot Pin Cyl.wpg



REMOTE TONG DOOR ASSEMBLY

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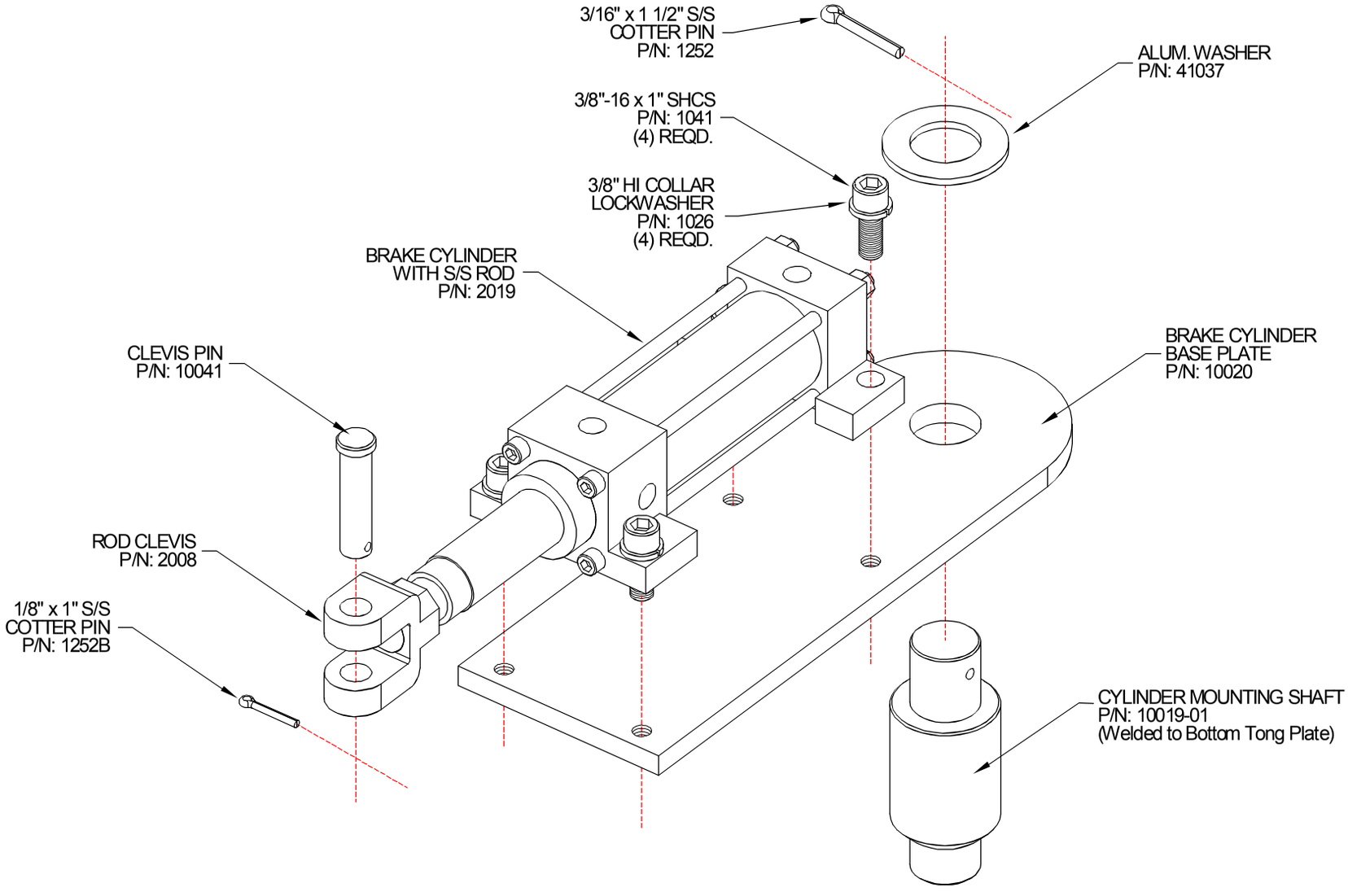
REV. #	LOG #	DATE
		11/20/02

REF: S:\Equip Manuals\Dwgs\CLE1075-02\Remote Door.wpg



BRAKE CYLINDER ASSEMBLY

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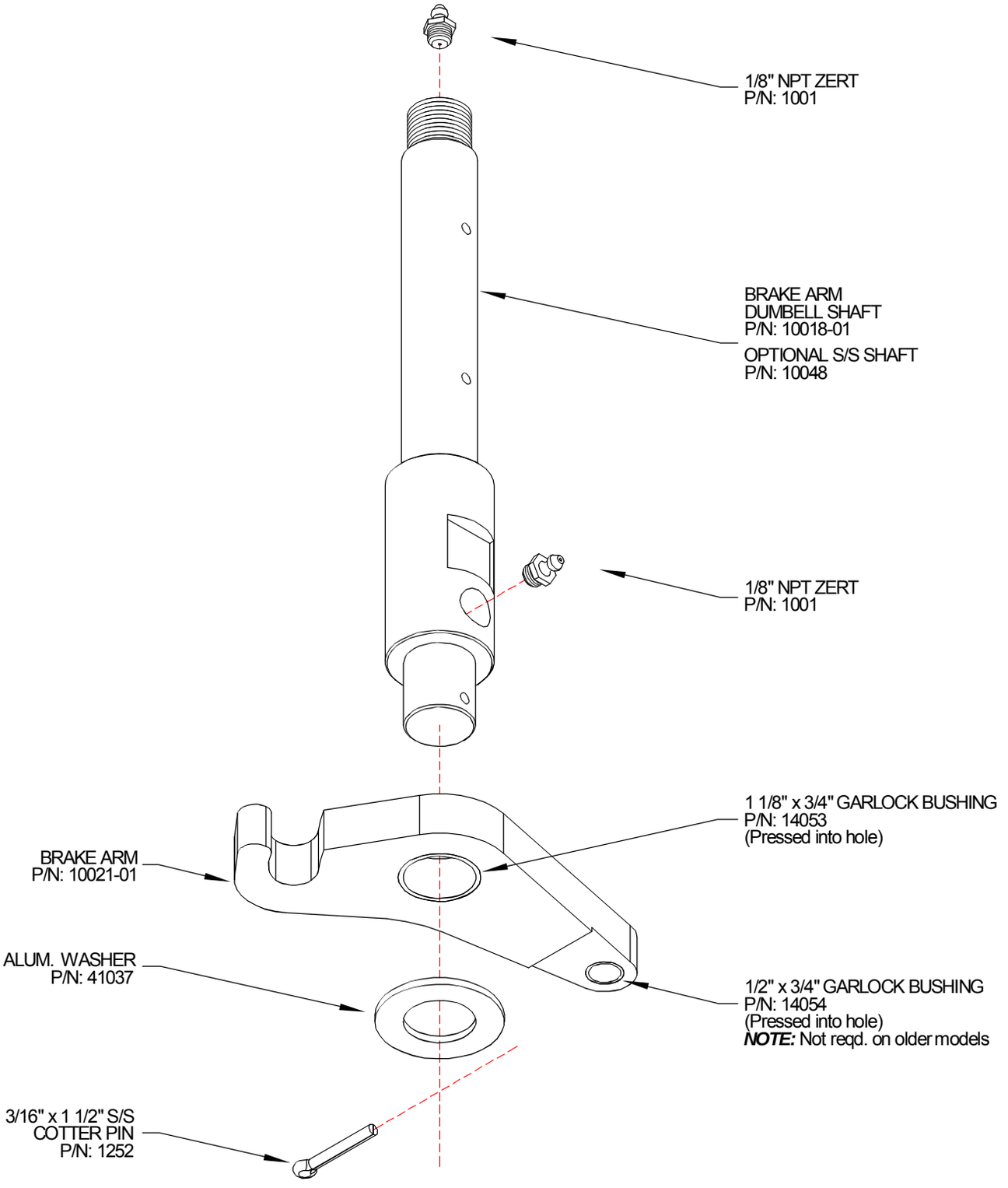
		11/20/02
REV. #	LOG #	DATE

REF: S:\Equip Manuals\Dwgs\CLE1075-02\Brake Cyl.wpg



BRAKE ARM ASSEMBLY

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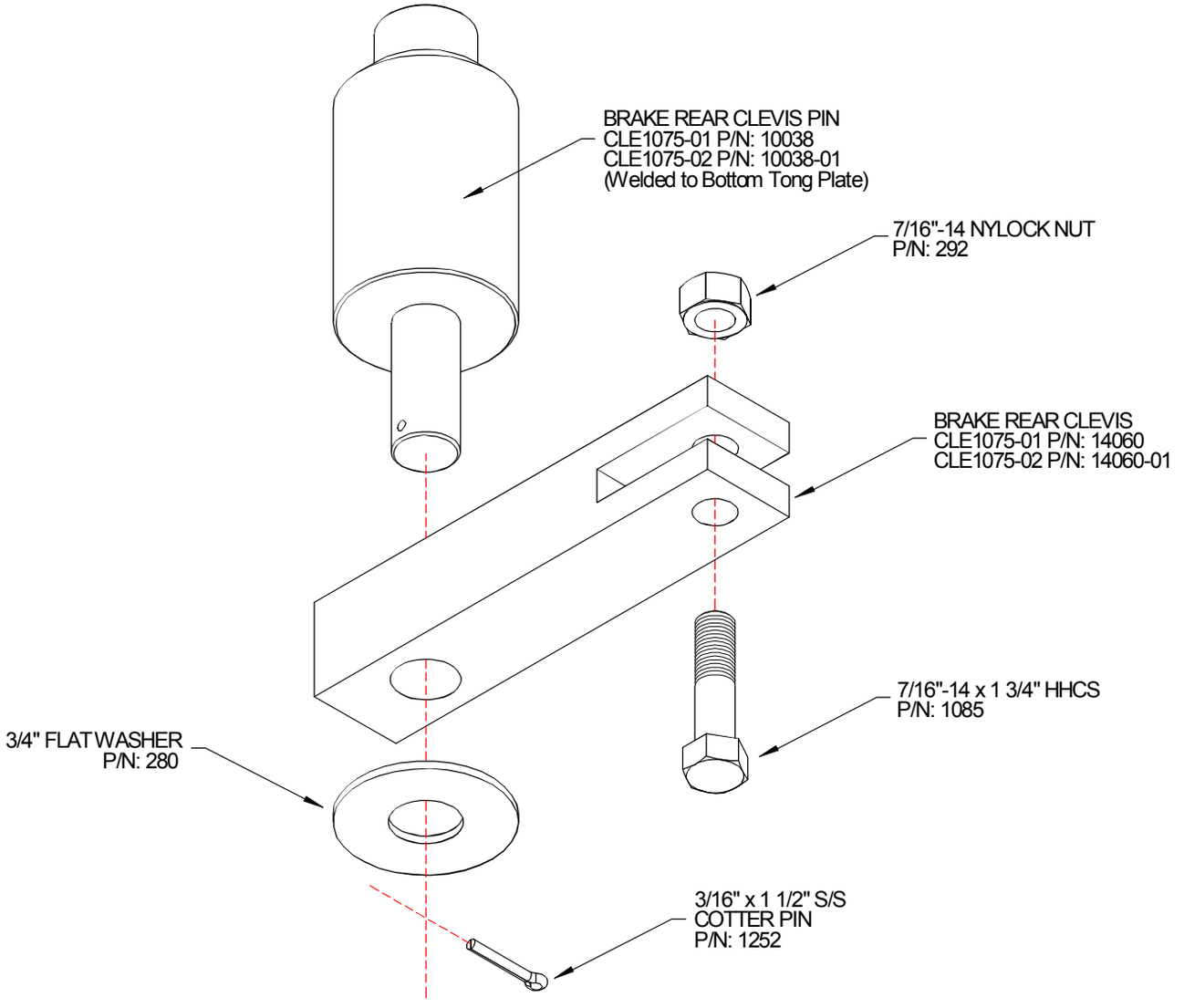
		11/20/02

REF: S:\Equip Manuals\Dwgs\CLE1075\Brake Arm.wpg



BRAKE REAR CLEVIS ASSEMBLY

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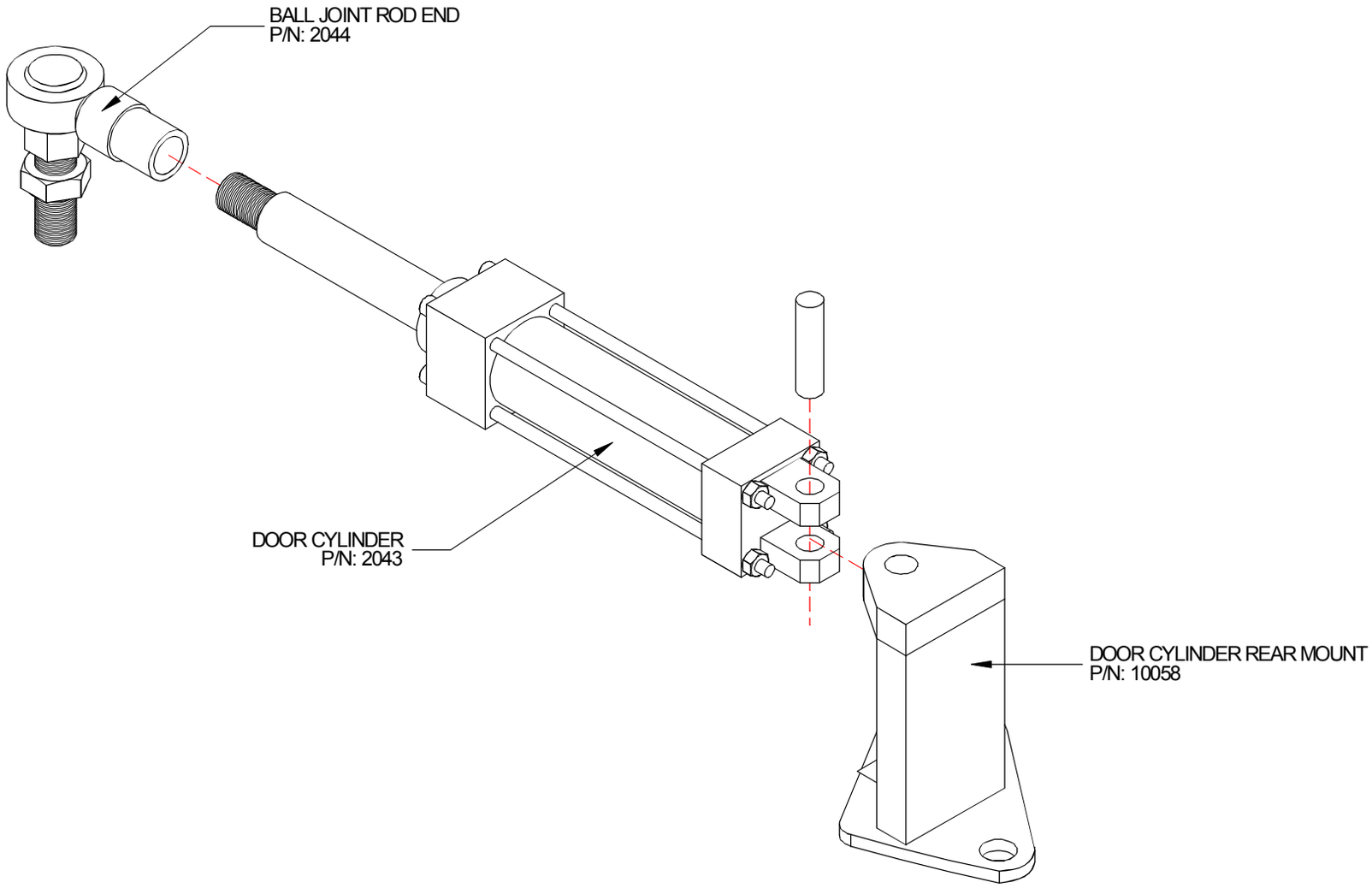
REV. #	LOG #	DATE
		11/20/02

REF: S:\Equip Manuals\Dwgs\CLE1075\Rear Clevis.wpg



DOOR CYLINDER ASSEMBLY

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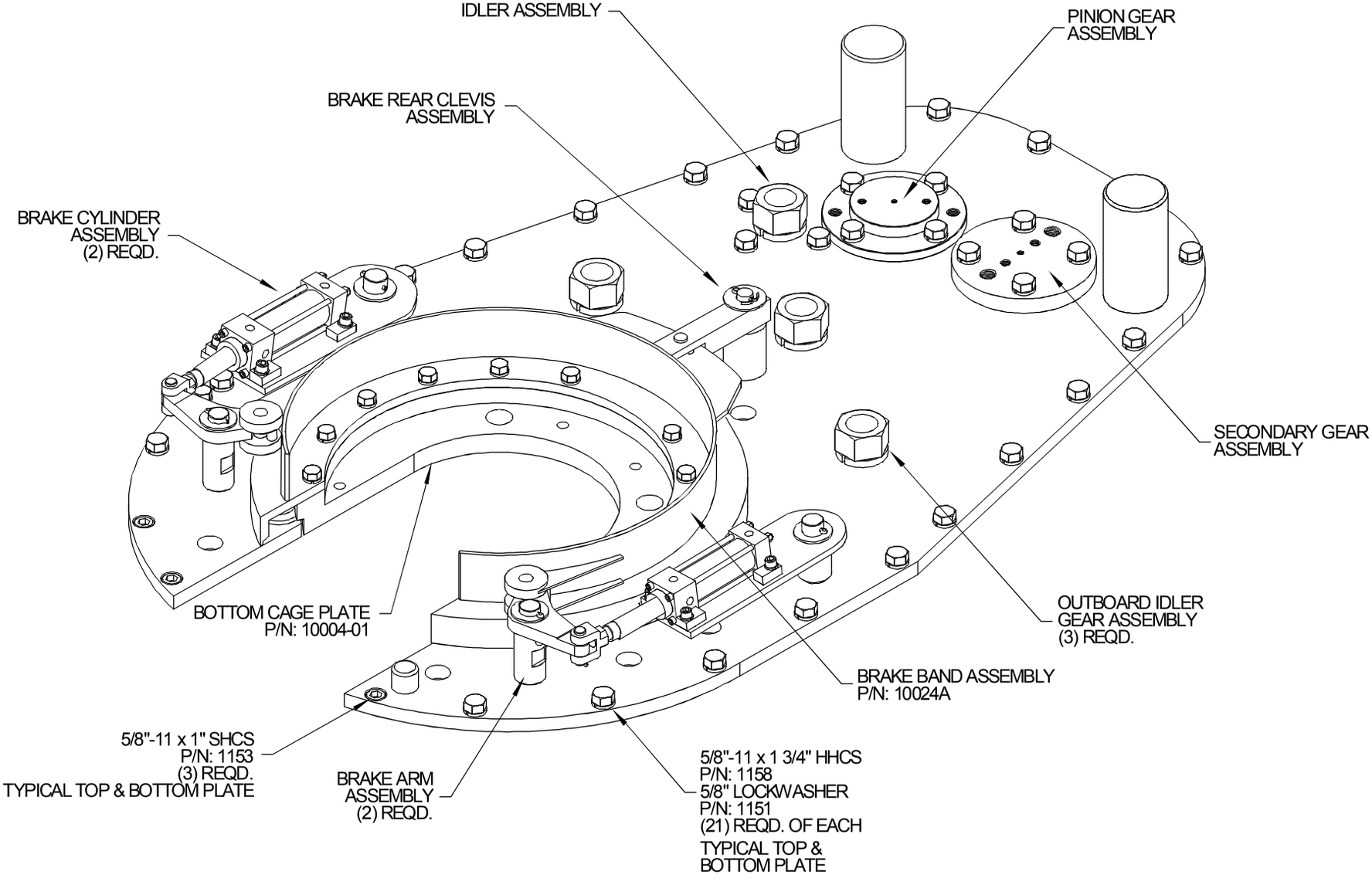
REV. #	LOG #	DATE
		11/20/02

REF: S:\Equip Manuals\Dwgs\CLE1075-02\Door Cylinder.wpg


IDLER ASSEMBLY
PINION GEAR ASSEMBLY
BRAKE REAR CLEVIS ASSEMBLY
BRAKE CYLINDER ASSEMBLY (2) REQD.
SECONDARY GEAR ASSEMBLY
BOTTOM CAGE PLATE P/N: 10004-01
OUTBOARD IDLER GEAR ASSEMBLY (3) REQD.
BRAKE BAND ASSEMBLY P/N: 10024A
5/8"-11 x 1" SHCS P/N: 1153 (3) REQD. TYPICAL TOP & BOTTOM PLATE
BRAKE ARM ASSEMBLY (2) REQD.
5/8"-11 x 1 3/4" HHCS P/N: 1158
5/8" LOCKWASHER P/N: 1151
(21) REQD. OF EACH TYPICAL TOP & BOTTOM PLATE

BOTTOM VIEW ASSEMBLY

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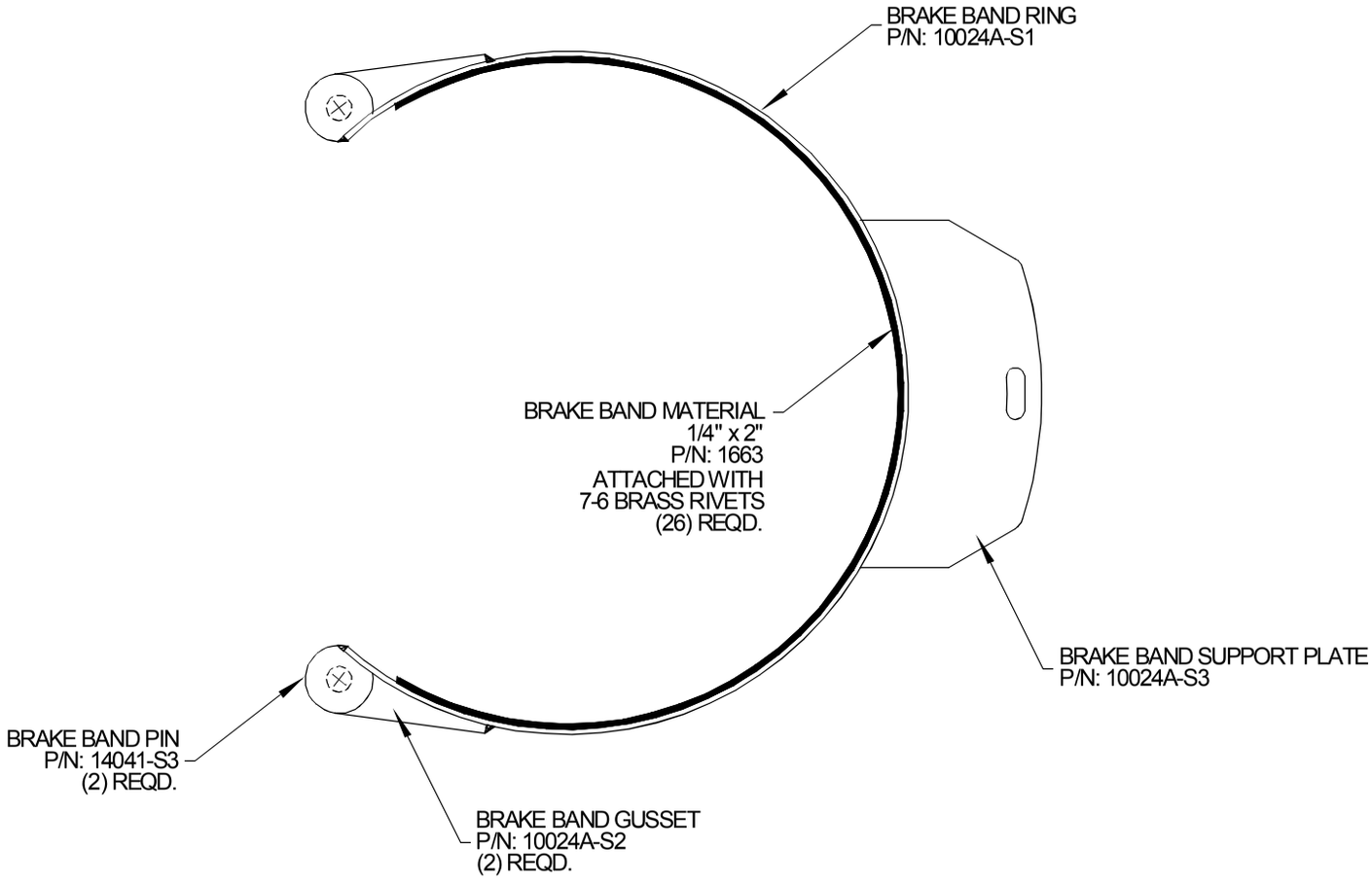
REV. #	LOG #	DATE
1		03/17/03

REF: S:\Equip Manuals\Dwgs\CLE1075-02\Bottom View rev1.wpg



BRAKE BAND ASSEMBLY

ASSEMBLY NO. 10024A

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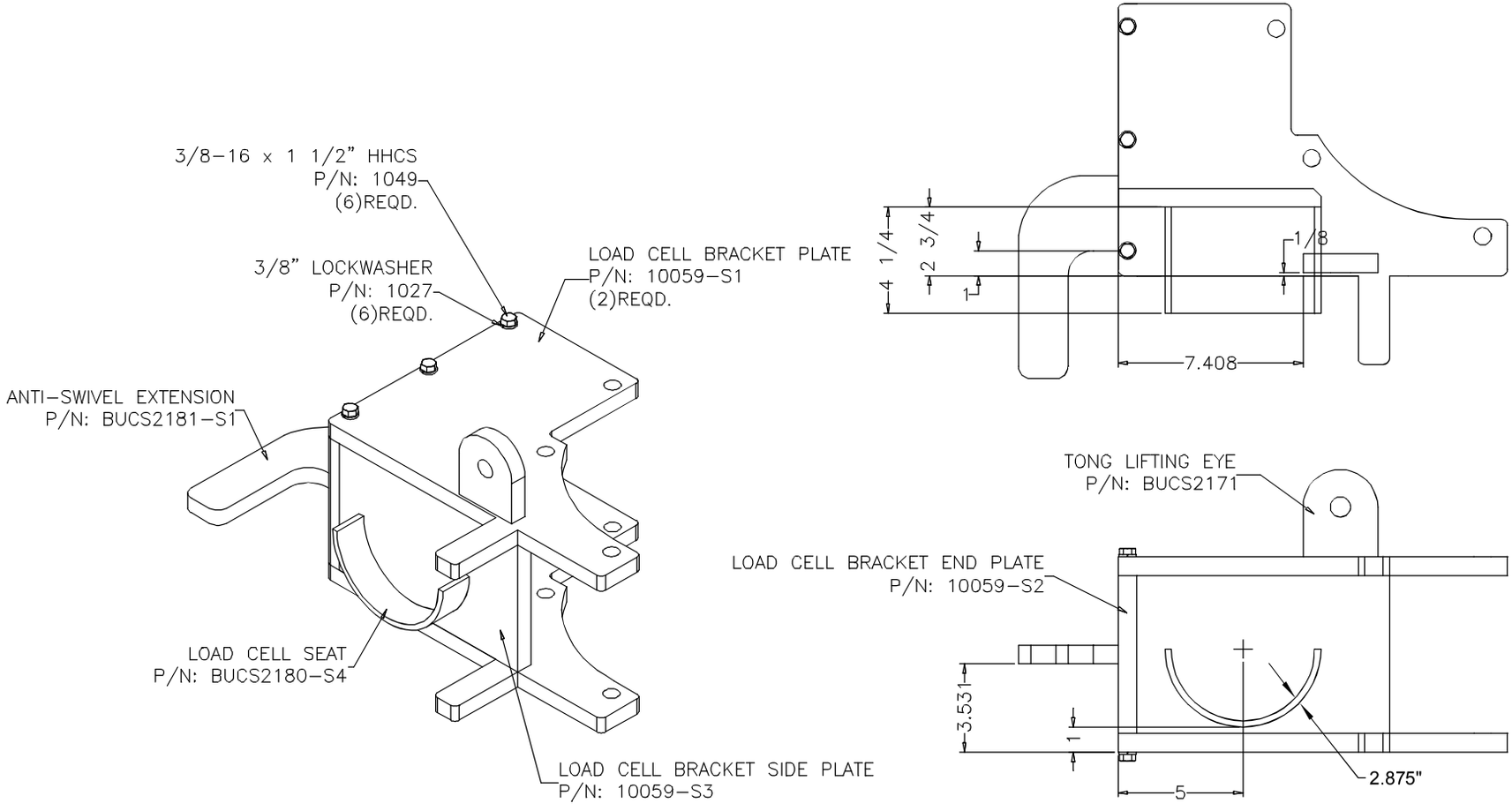
REV. #	LOG #	11/20/02 DATE

REF: S:\Equip Manuals\Dwgs\CLE1075\Brake Band.wpg



10 3/4" REMOTE TONG
LEFT LOAD CELL BRACKET

ASSEMBLY NO. 10059L

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		11/21/02
REV. #	LOG #	DATE

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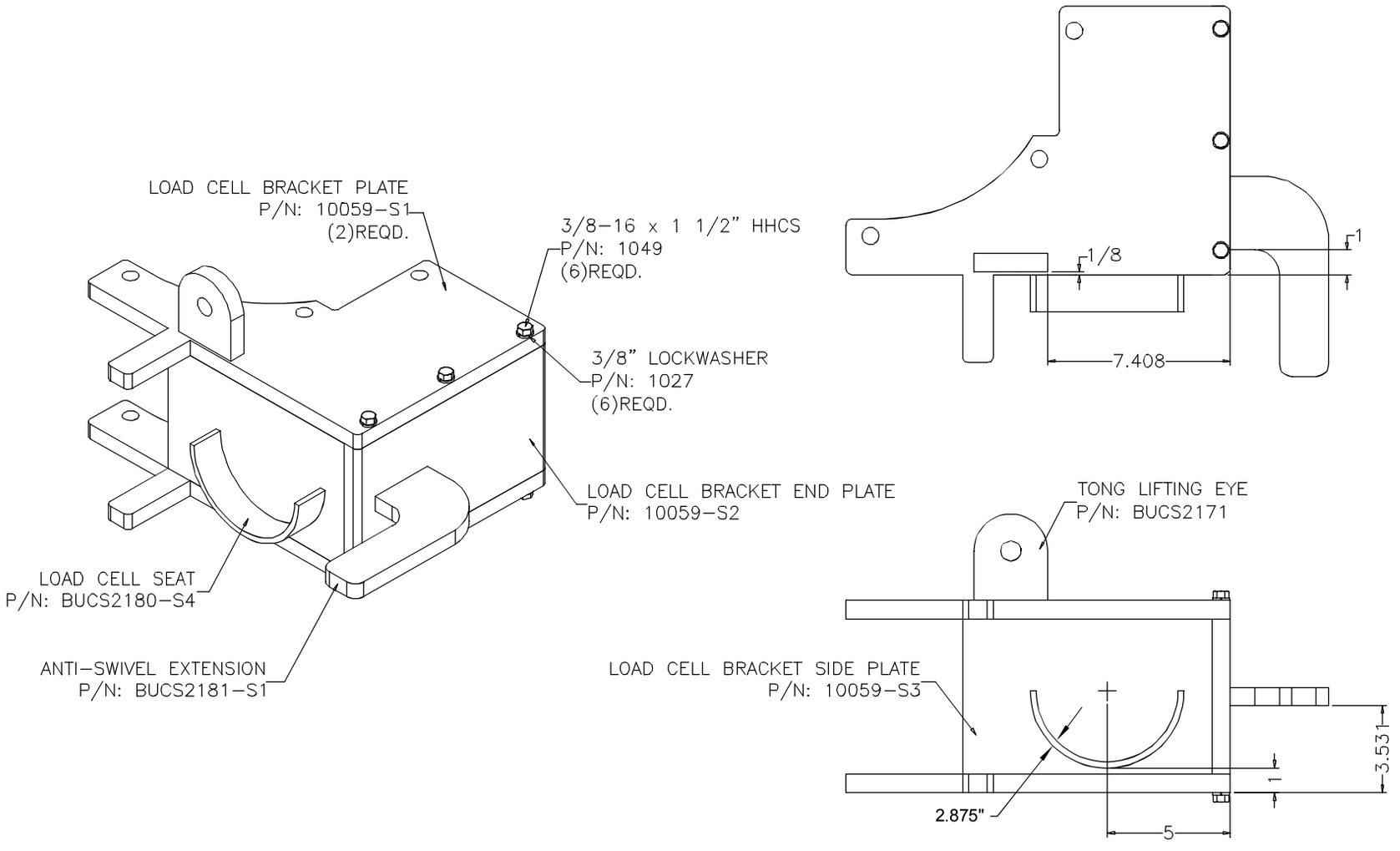

10 3/4" REMOTE TONG
RIGHT LOAD CELL BRACKET

ASSEMBLY NO. 10059R

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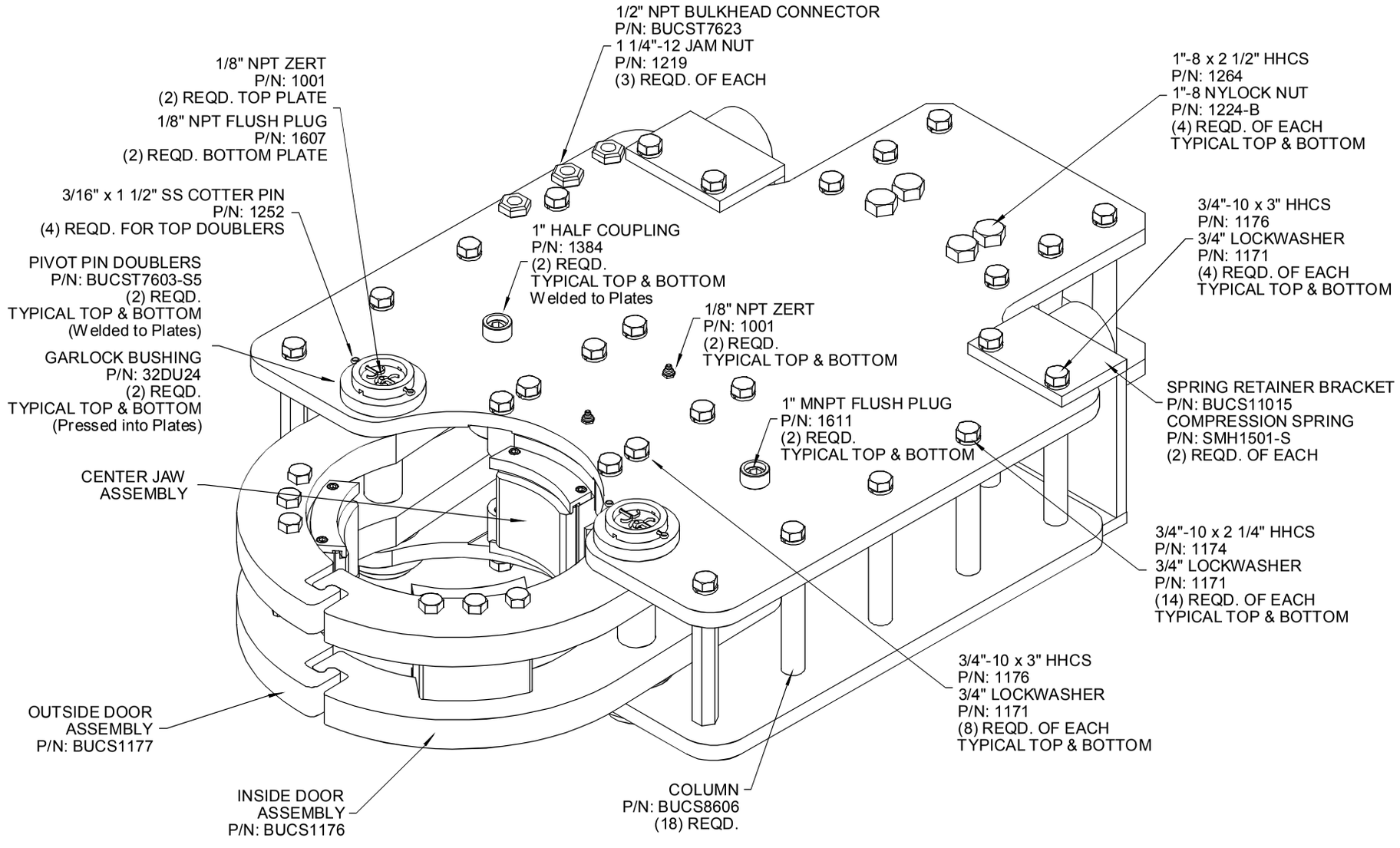
		11/21/02
REV. #	LOG #	DATE

REF: S:\Equip Manuals\Dwgs\CLE1075-02\10059R.wpg

SECTION 10 11 3/4" LOCKJAW™ BACKUP ILLUSTRATIONS

11 3/4" **LOCKJAW™** BACKUP ASSEMBLY ..... 10 - 3
TOP VIEW WITHOUT TOP PLATE ..... 10 - 4
CYLINDER ASSEMBLY *(Assy. No. SHC1175)* ..... 10 - 5
CENTER JAW ASSEMBLY ..... 10 - 6
INSIDE DOOR ASSEMBLY *(Assy. No. BUCS1176)* ..... 10 - 7
OUTSIDE DOOR ASSEMBLY *(Assy. No. BUCS1177)* ..... 10 - 8



11 3/4" LOCKJAW™ BACKUP

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REV. #	LOG #	DATE
1		03/18/03

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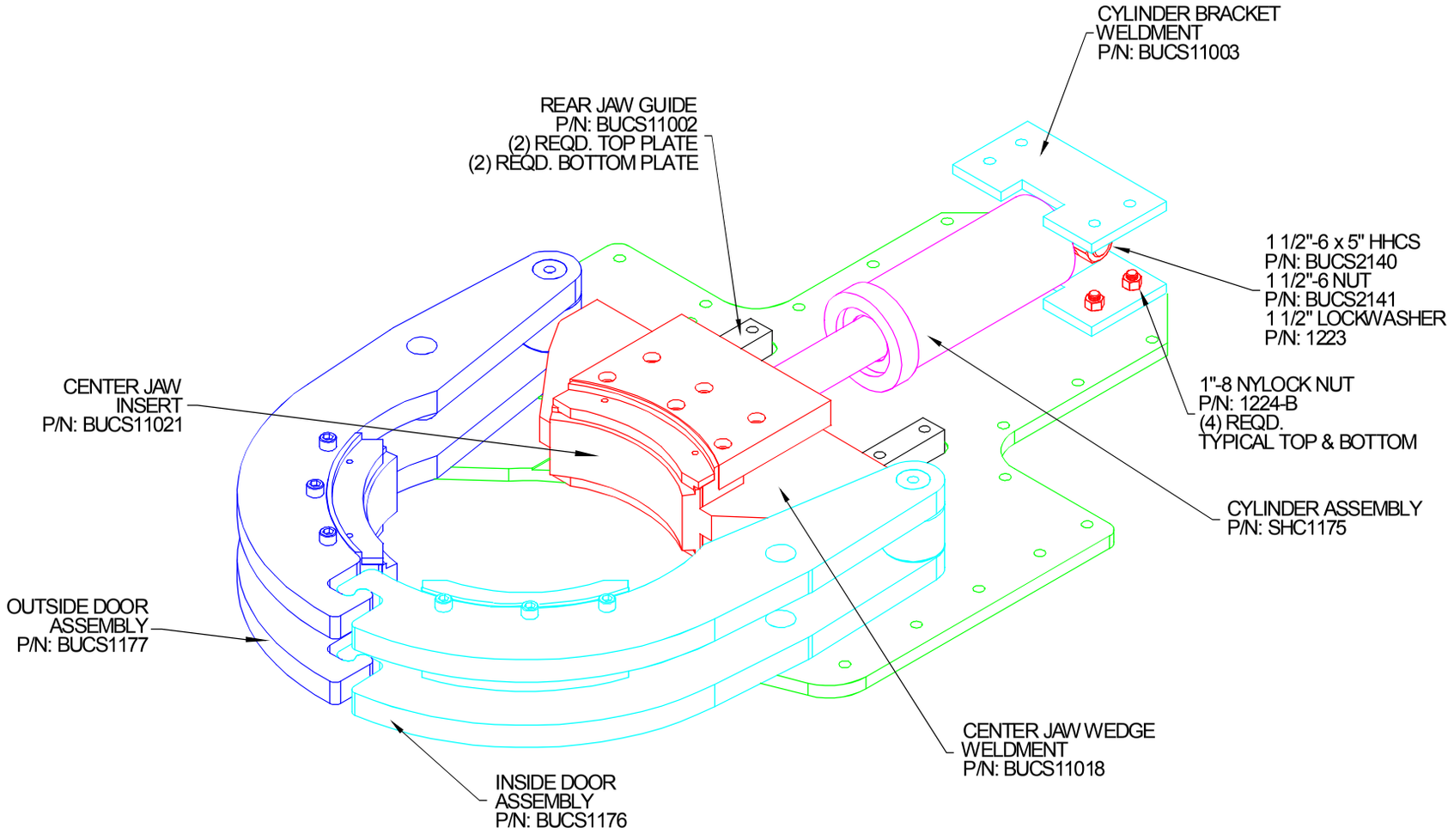

11 3/4" LOCKJAW™ BACKUP

SHOWN WITHOUT TOP PLATE

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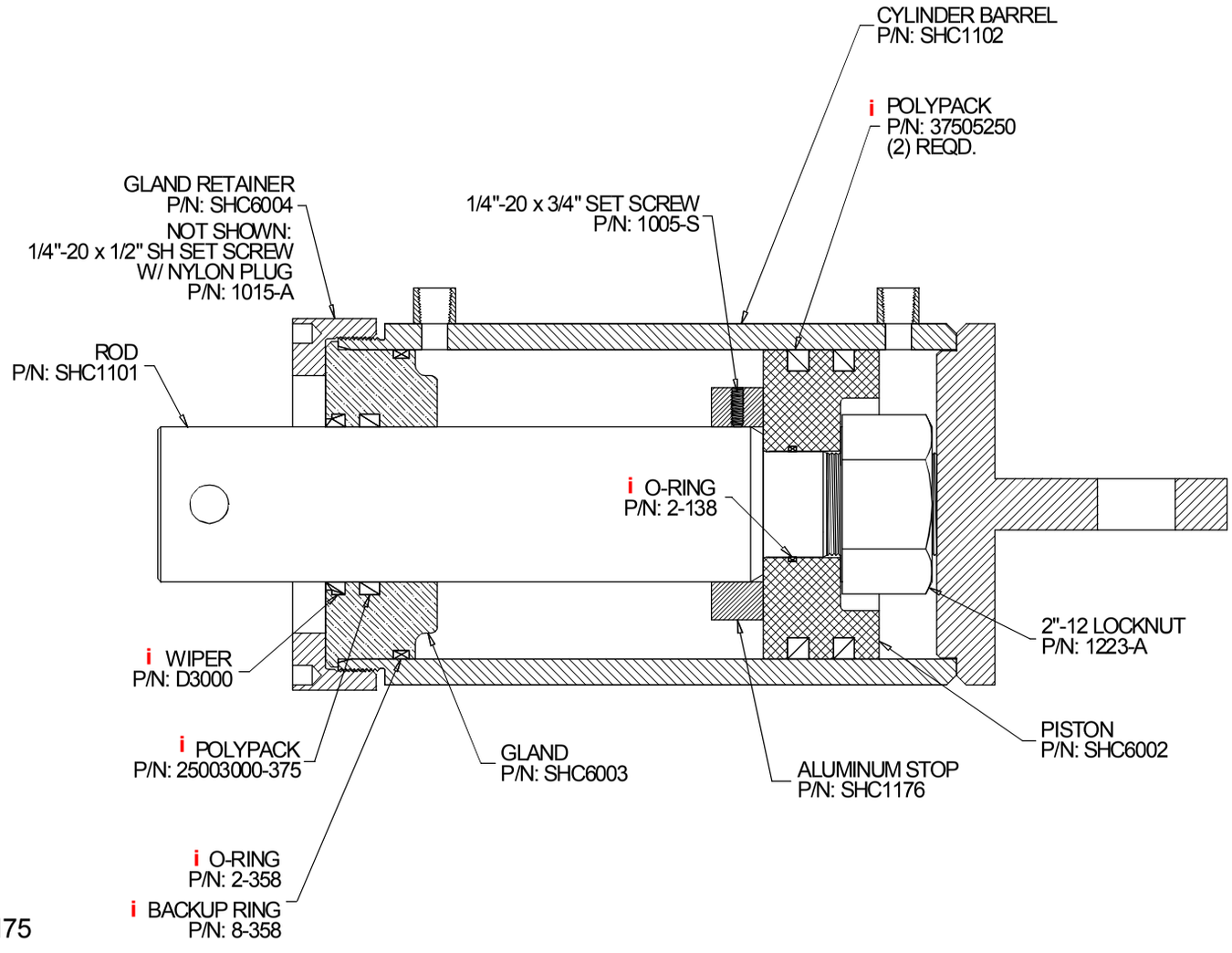
		12/22/02
REV. #	LOG #	DATE

REF: S:\Equip Manuals\Dwgs\BUCS1175\Top View.wpg



i SEAL KIT
P/N: ASAP1175

CYLINDER ASSEMBLY

ASSEMBLY NO. SHC1175

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REV. #	LOG #	DATE
		11/22/02

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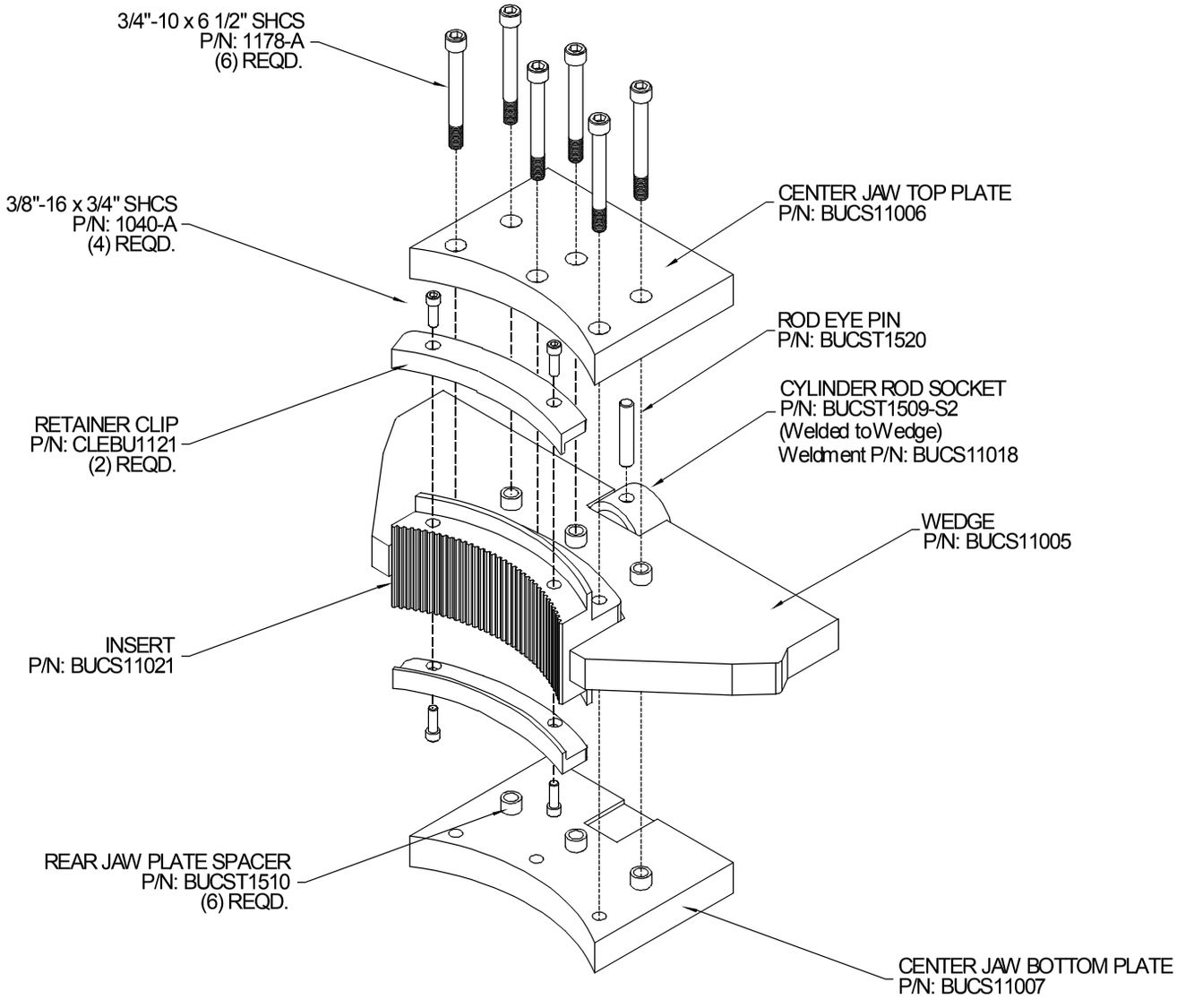

CENTER JAW ASSEMBLY

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REV. #	LOG #	DATE
		11/22/02

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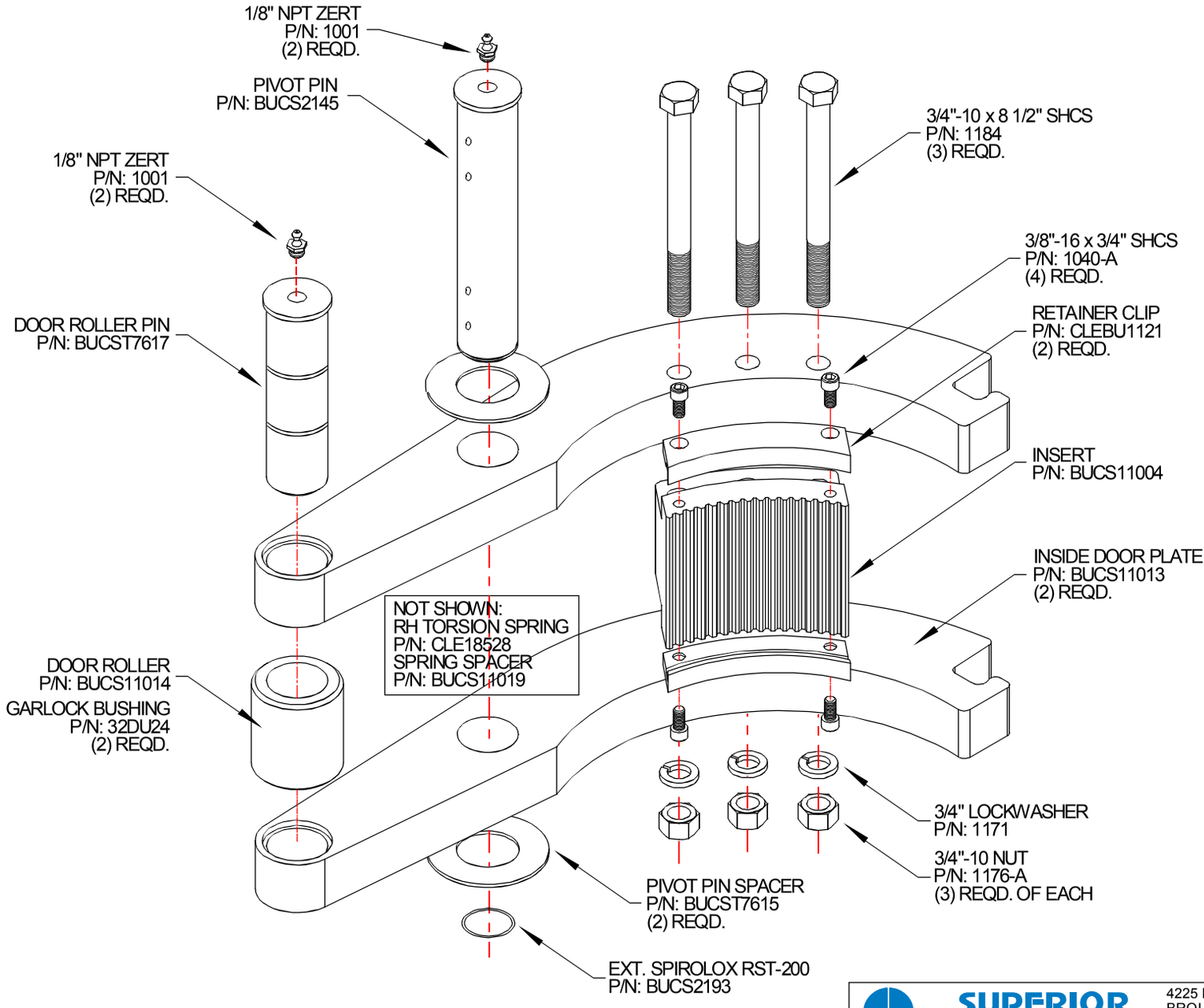

INSIDE DOOR ASSEMBLY

ASSEMBLY NO. BUCS1176

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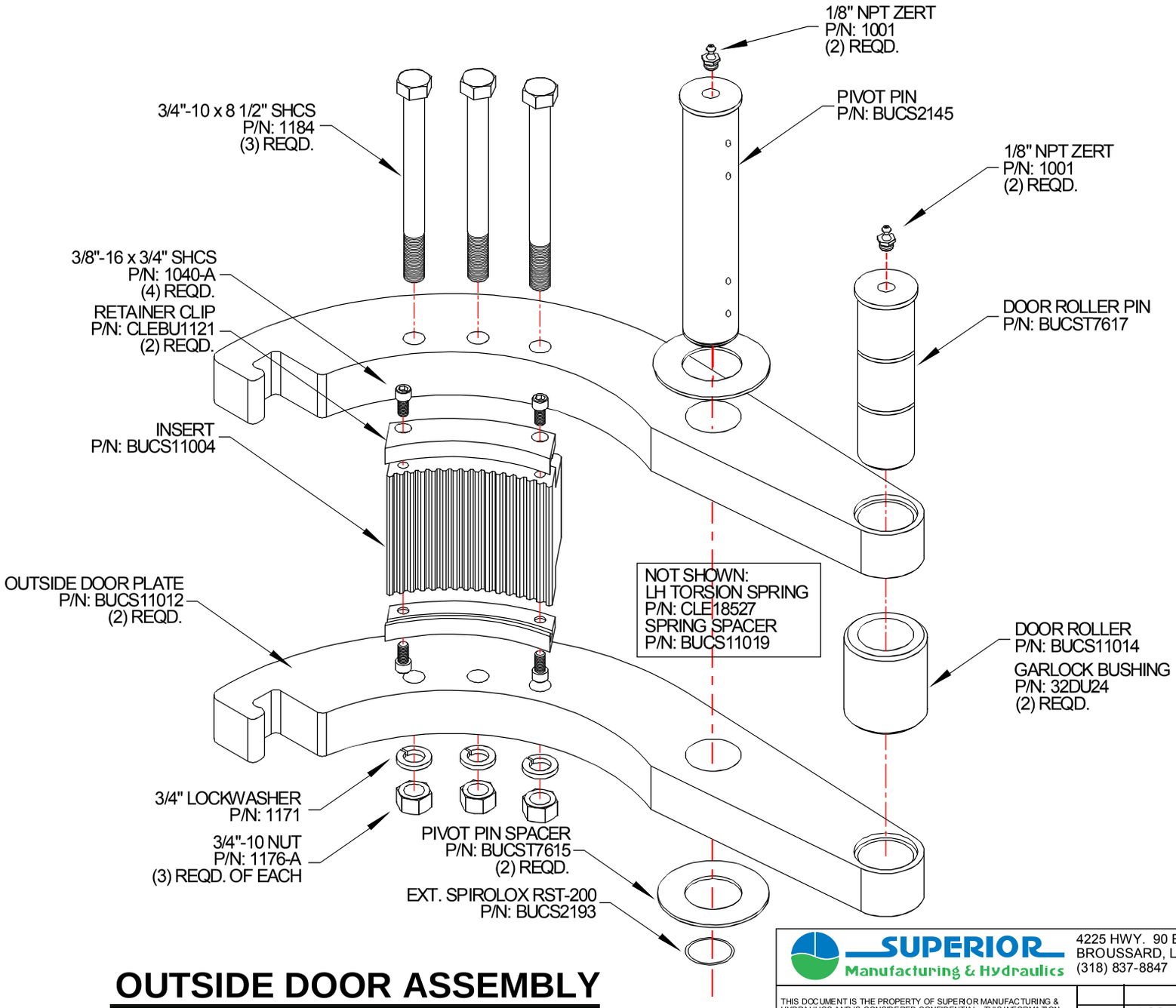
		11/22/02
REV. #	LOG #	DATE

REF: S:\Equip Manuals\Dwgs\BUCS1175\Door Inside.wpg



OUTSIDE DOOR ASSEMBLY

ASSEMBLY NO. BUCS1177

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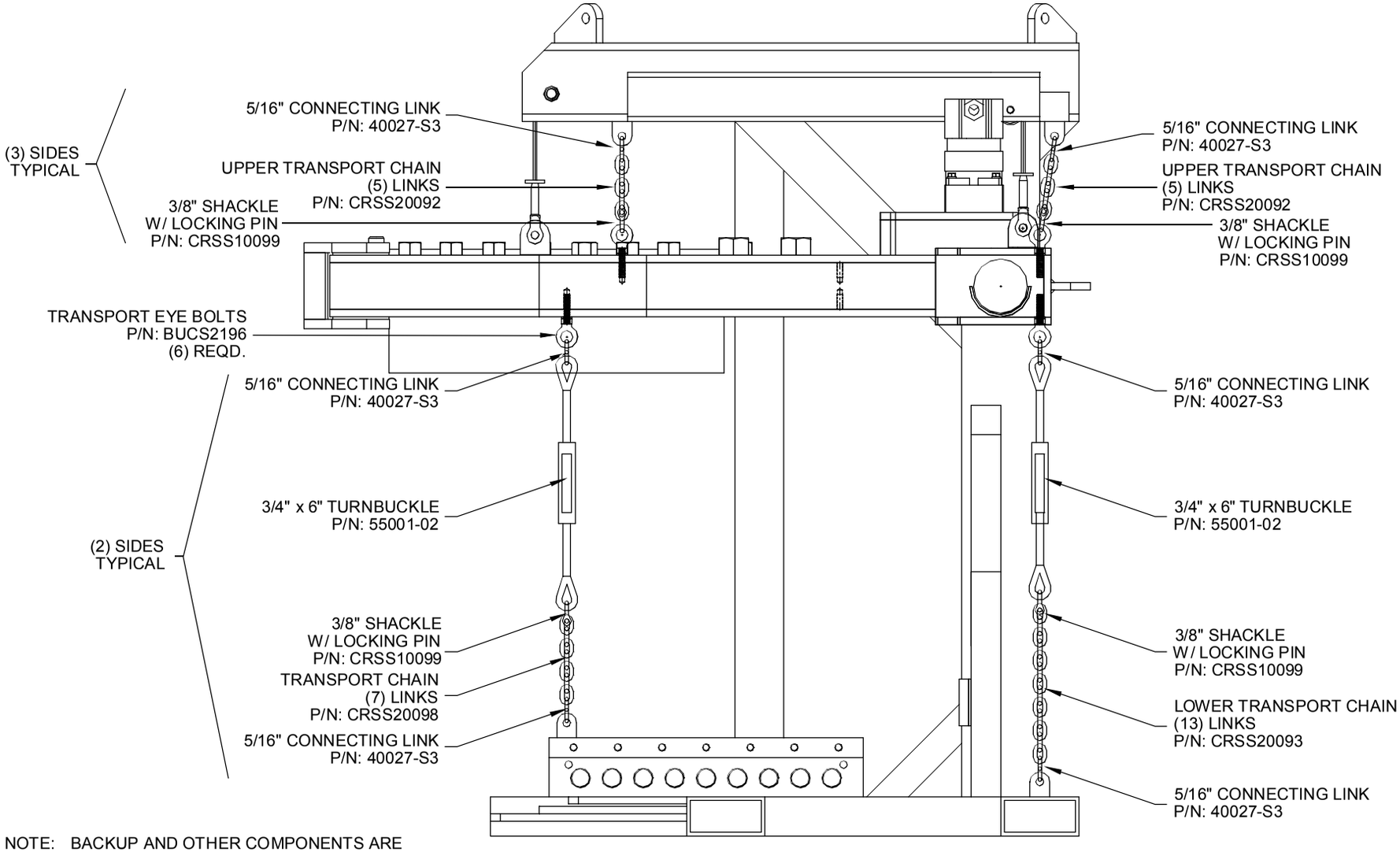
		11/22/02
REV. #	LOG #	DATE

REF: S:\Equip Manuals\Dwgs\BUCS1175\Door Outside.wpg

SECTION 11 SUSPENSION SYSTEM ILLUSTRATIONS

TRANSPORT FOR SUSPENSION SYSTEM ..... 11 - 3
CRSS1000 SUSPENSION SYSTEM FRAME ASSEMBLY ..... 11 - 4
LARGE SPRING ASSEMBLY ..... 11 - 5
SMALL SPRING ASSEMBLY ..... 11 - 6
SPRING CABLE ASSEMBLY *(Assy. No. BUCS2157)* ..... 11 - 7


(3) SIDES TYPICAL
5/16" CONNECTING LINK P/N: 40027-S3
UPPER TRANSPORT CHAIN (5) LINKS P/N: CRSS20092
3/8" SHACKLE W/ LOCKING PIN P/N: CRSS10099
TRANSPORT EYE BOLTS P/N: BUCS2196 (6) REQD.
5/16" CONNECTING LINK P/N: 40027-S3
(2) SIDES TYPICAL
3/4" x 6" TURNBUCKLE P/N: 55001-02
3/8" SHACKLE W/ LOCKING PIN P/N: CRSS10099
TRANSPORT CHAIN (7) LINKS P/N: CRSS20098
5/16" CONNECTING LINK P/N: 40027-S3
5/16" CONNECTING LINK P/N: 40027-S3
UPPER TRANSPORT CHAIN (5) LINKS P/N: CRSS20092
3/8" SHACKLE W/ LOCKING PIN P/N: CRSS10099
5/16" CONNECTING LINK P/N: 40027-S3
3/4" x 6" TURNBUCKLE P/N: 55001-02
3/8" SHACKLE W/ LOCKING PIN P/N: CRSS10099
LOWER TRANSPORT CHAIN (13) LINKS P/N: CRSS20093
5/16" CONNECTING LINK P/N: 40027-S3

NOTE: BACKUP AND OTHER COMPONENTS ARE NOT SHOWN FOR CLARITY PURPOSES.

SIDE VIEW

TRANSPORT FOR SUSPENSION SYSTEM

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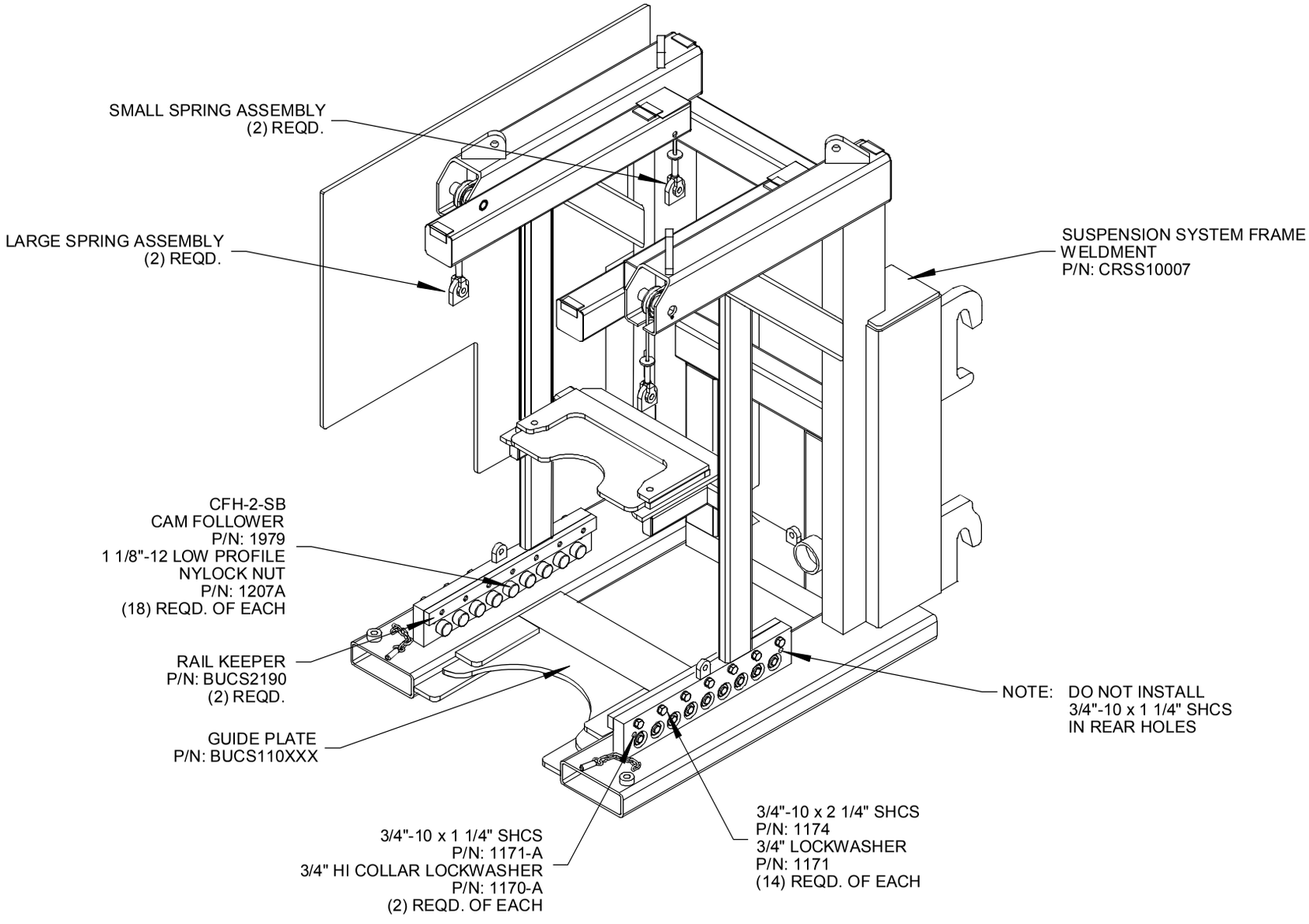
REV. #	LOG #	DATE
1		03/18/03

REF: S:\Equip Manuals\Dwgs\CRSS10750\Transport rev1.wpg



SUSPENSION SYSTEM

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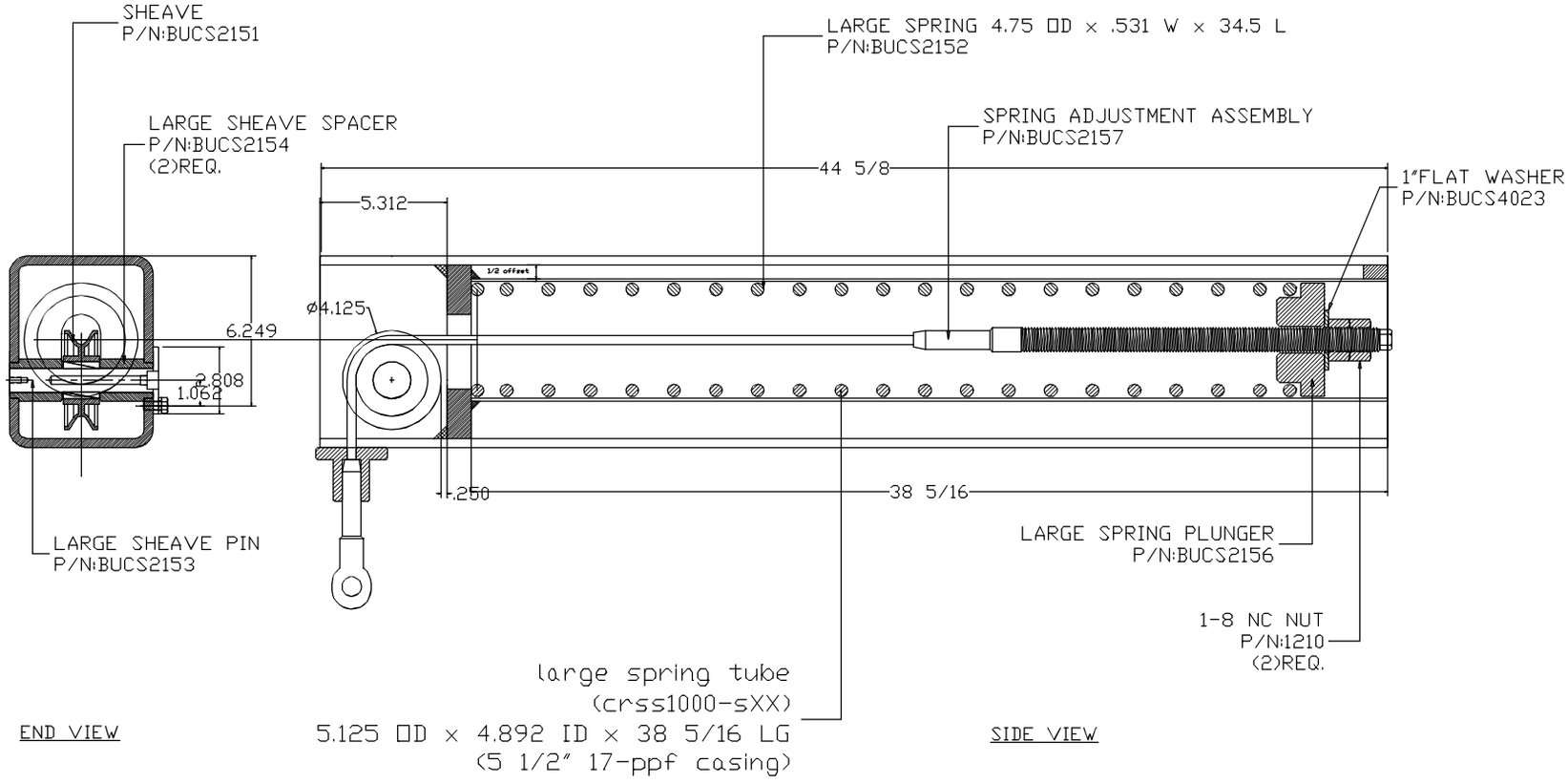
		12/03/02
REV. #	LOG #	DATE

REF: S:\Equip Manuals\Dwgs\CRSS10750\Sus System.wpg



WARNING: **Springs can store considerable energy which could cause injuries or fatalities if proper removal procedures are not utilized. See Spring Removal & Installation Procedures in Section 4.**

LARGE SPRING ASSEMBLY

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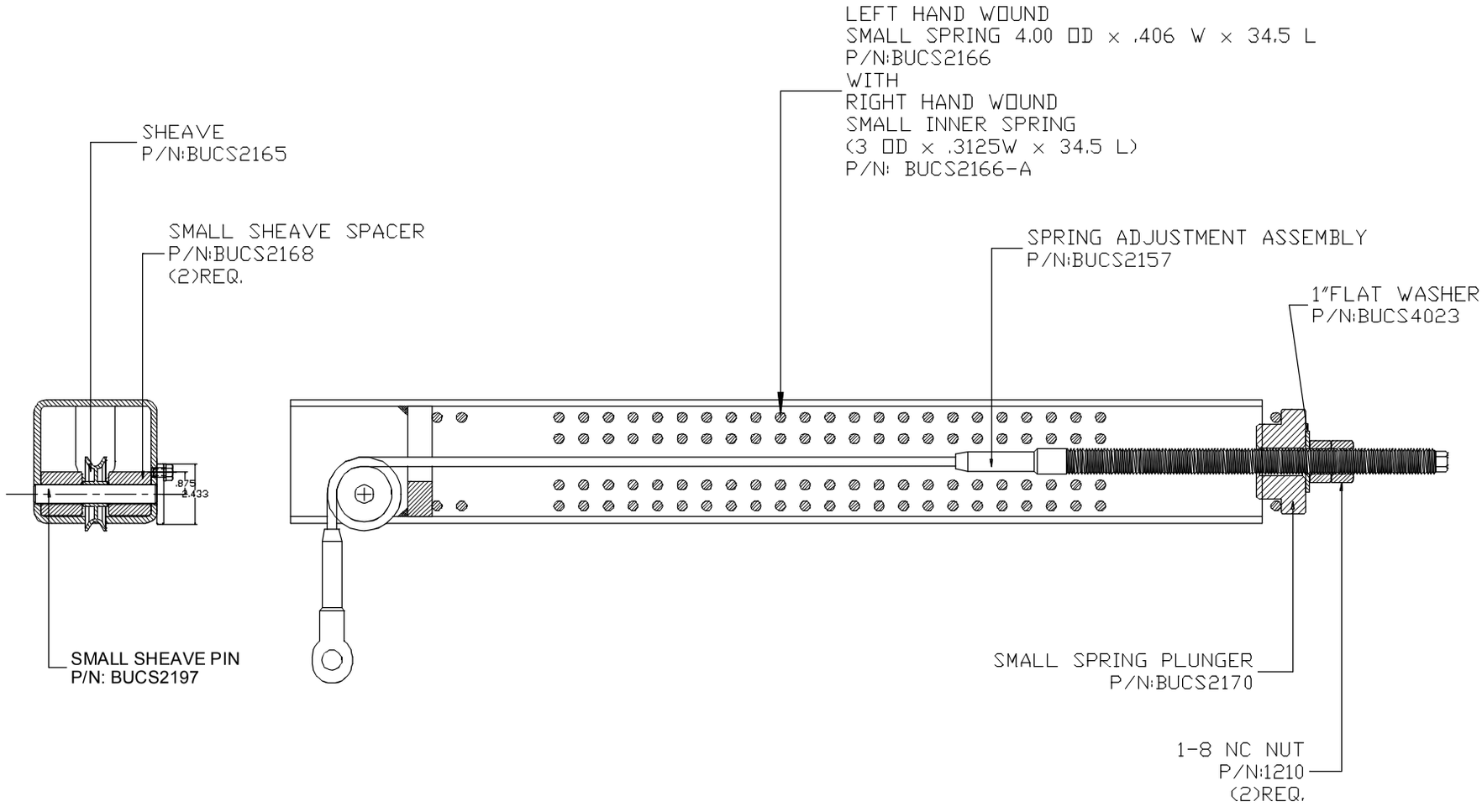
REV. #	LOG #	DATE
1		12/26/02

REF: S:\Equip Manuals\Dwgs\CRSS10750\Large Spring rev1.wpg



END VIEW

SIDE VIEW

WARNING: Springs can store considerable energy which could cause injuries or fatalities if proper removal procedures are not utilized. See Spring Removal & Installation Procedures in Section 4.

SMALL SPRING ASSEMBLY

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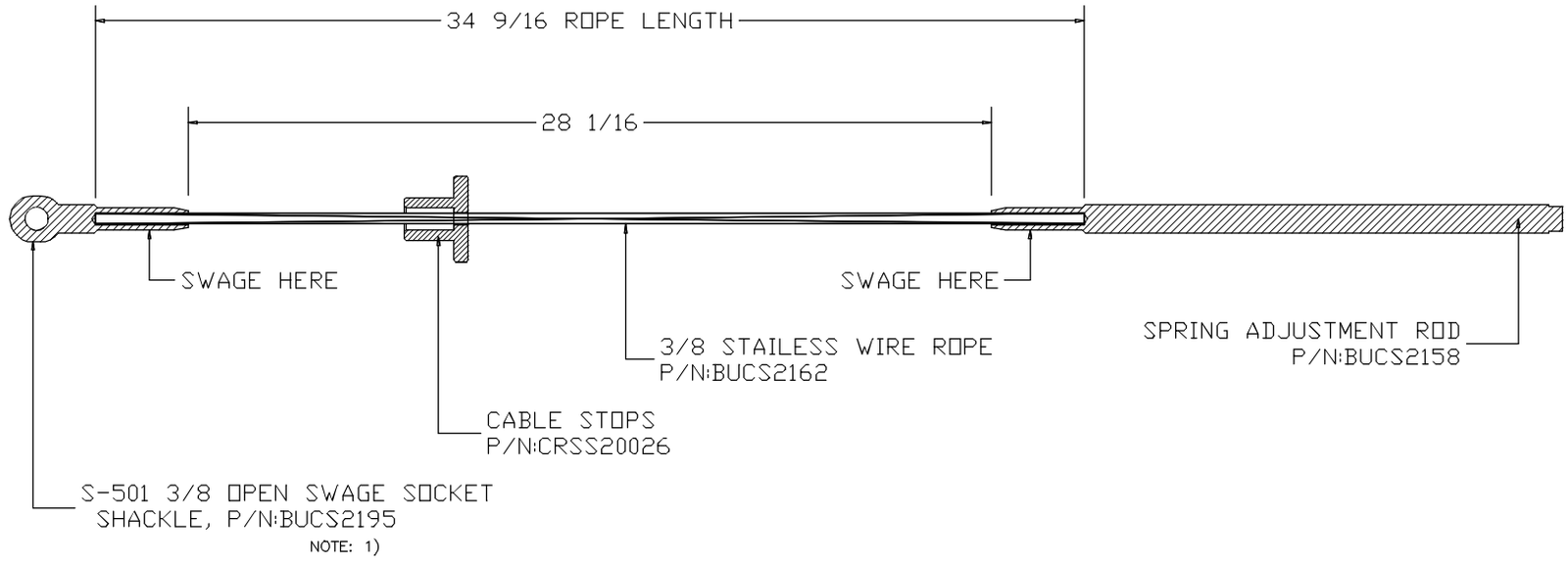
REV. #	LOG #	DATE
2		03/18/03

REF: S:\Equip Manuals\Dwgs\CRSS10750\Small Spring rev2.wpg

NOTE:

SWAGE TO MANUFACTURE SPECIFICATIONS.
TENSILE TEST TO 2,000 LBS. Min.
TEST CERTIFICATION REQUIRED.



NOTE: 1) USE PIN P/N: BUCS2195-S1
AS REPLACEMENT ONLY

Rev.#	By	Log#	Description of Revision
3			
2			
1			

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE

2 PLACE DEC. ±.020	3 PLACE DEC. ±.005	FRACTIONS ± 1/16	ANGLES ± .5'	SURFACE 250	FLATNESS AR PL. ± .015 per foot

1. Dimensions are in inches
2. Remove burrs & sharp edges with 1/64x45°max.
3. Machined fillet radii are 1/32
4. Normality,Squareness & parallelism of machine surfaces are .002 per inch, to a max of .012 inches for a single surface.
5. Machine diameters on a common centerline must be concentric within .005 T.I.R & unmachined diameters concentric within .032 T.I.R

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△1 or ⬠1 = Revision Number

1.000 = Critical Dimension 100% Inspection Required

SHEET 1 of 1

SUPERIOR Manufacturing & Hydraulics
4225 HWY.90 E
BROUSSARD,LA 70518
(318)837-8847

PART NAME: SPRING ADJUSTMENT ASSEMBLY FOR 20/21 SUSPENSION SYSTEM

PART #: BUCS2157	MATERIAL SPECIFICATION
DRAWN BY: NING M	Matl.Req:
APPROVED BY: DAVID B	Initial Condition:
CHK BY: DATE: 6-16-98	H.T Instructions:
REF: F:\DWG\BUCS2157	Case Depth:

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SECTION 12 MOTOR SERVICE MANUALS

To request copy of Rineer Motor Service Manuals, please contact:

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Fax: 337-837-8839
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